

THE AUTOMOBILE

Garden of Allah as Touring Field



TOURISTS IN ALGERIA TRAVELING ALONG THE BED OF A CREEK AT BISKRA

FOREIGN touring *en motor* is shrouded with more or less glamour and despite the fact that each year finds a large increase in the number of American tourists who seek foreign fields for pleasure and recreation, a material section of whom are automobilists, there is still sufficient novelty about a foreign trip to make it very attractive.

The show places of Europe are become beaten pathways for American automobile parties and as Asia and South America are still somewhat too chaotic from a road viewpoint to make good touring fields, the attention of prospective visitors is naturally directed toward Northern Africa after the splendors of Europe have been exhausted.

At the present moment the war being carried on by Italian troops in Tripoli has centered the eyes of the world on the Mediterranean coast of Africa. Egypt has long been familiar with the automobile. Tripoli has been too unsettled politically

to attract tourists with their cars to any great extent and the same might be said for Morocco, on the Atlantic coast.

But Algeria, the French sphere of influence in northern Africa, presents a more attractive outlook for the automobilist who desires to tread more or less unbeaten paths.

The city of Algiers, capital of the department, is situated on the sea coast in about the same latitude as Washington, D. C., St. Louis, Mo., and San Francisco, Cal. The country extends southward in three great upward steps until human boundary lines are lost in the shifting, mysterious sands of the Sahara.

The Atlas mountains run parallel with the coast from Tunis to the eastern boundary of Morocco. These mountains, which are not particularly lofty nor impressive from the modern viewpoint, have been famous since mythological times because they were likened to the giant Atlas, who was said to support the world on his shoulders.

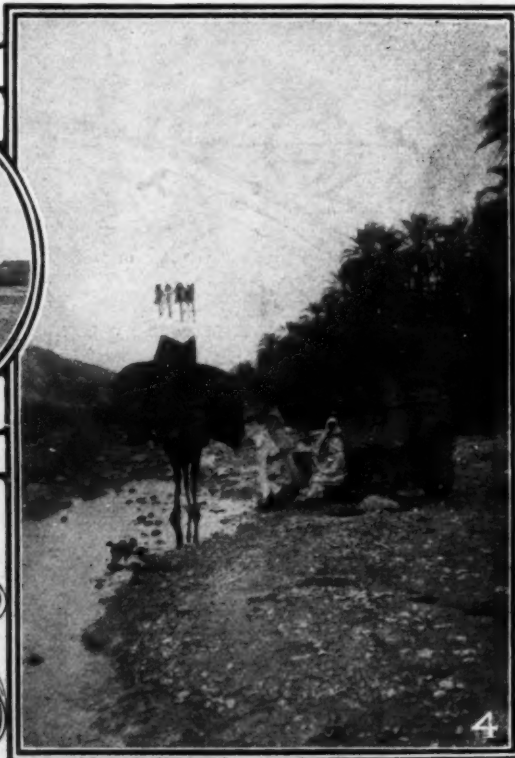
South from the mountains lie a series of plains call sebkhas, which are covered with vegetation similar in character to the plains of Idaho. Numerous salt lakes are sprinkled here and there over the sebkhas. This section is bounded on the south by another range of mountains and behind the mountains is the Sahara.

The northern valleys are fertile and under the name of the Tell, once constituted a factor in supplying grain to various European countries, especially Italy. Algeria has a mean temperature of 63 deg., which makes it excessively hot in summer, but delightful for American tourists from November to April.

The history of Algeria explains why there are probably 1,000 miles of excellent automobile highway in the country. The Moors, Arabs, Turks and negroes never built a road except

Navy, destroyed the sea power of Algeria in battle and crushed the institution of piracy, causing the release of 1,200 European and American slaves who had been taken in the various incursions of the piratical deys.

In 1830 the Turkish power in Algeria was broken and the Turks expelled by the invading French. For 40 years after the initial occupation, the French were constantly embroiled, occasionally defeated by the Arab chieftains and always more or less tangled up with war, graft and mismanagement. But since 1870 the situation in Algeria has become more stable and today, while the country is much less traveled than Egypt, it is practically as safe as France itself from the standpoint of the automobile tourist and still sufficiently unknown to the world generally to prove attractive.



2—Departure of a caravan of camels escorted by an automobile

3—All the natives come out to witness the arrival of the tourists

4—Ancient and modern means of desert travel exemplified

under military compulsion, and as military exigencies along the lines of road building were never pressing during the control of the country by either of the elements mentioned, the present road system may be attributed almost *in toto* to the French.

At the beginning of the Nineteenth century Algeria was a Turkish dependency. It was governed by a combination composed of a native dey and a Turkish pasha. Being somewhat isolated from the fountainhead of the Ottoman government, the dey of Algiers was able to strain the bonds sufficiently to allow a system of piracy to become the chief industry of his subjects. All nations either paid tribute to the corsairs or suffered robbery at sea. Time after time punitive expeditions were directed against the practices of the deys but nothing decisive was accomplished until Commodore Decatur, of the United States

The history of the roadmaking in Algeria is closely associated with the French military occupation. The first expeditions were in the nature of landing parties backed by the fleet and the soldiers stuck closely to the garrisoned cities. When it became necessary to repel attack the sorties were made by flying columns and the distances covered were comparatively unimportant.

The history of nearly all of the French expeditions proved to be similar until a different plan was devised. The French generals would gain victory after victory against the elusive and well-mounted irregular cavalry and once in about 10 years an army division would be wiped out by the Algerians. It has been estimated that the French occupation cost the lives of 150,000 men and \$800,000,000 up to 1870.

But a few years before that date an improved plan of occupation had been devised and instead of moving against the shadowy Arabs with flying columns, the Europeans gradually forced them back by main strength, establishing civil governments in the places within their lines, building military roads in their rear and step by step forcing the natives into the hills and beyond. This plan proved effective and in a surprisingly short space of time the leaders of the insurrection were pushed out into the Sahara and there was peace in Algeria.

The uninhabitable character of the desert, save here and there where springs and wells cause an oasis to bloom amid the somber sand, marks the limits of civilization and while practically all the country included in the classification sebkhas, can be made exceedingly productive, the really productive section at

There are two good ways to reach Setif, which is a divisional point on the route from Algiers to Biskra. The first of these is to take the coast road through Tizi Ouzon to Bougie and then go south through Kerratta, reaching Setif from the north.

The other way is more spectacular and interesting. The coast road is very similar to the average well-kept French highway, although it is set in a picture of vastly more interest than is presented by the usual French country side. But the alternate road that may be used in reaching Setif is interesting in every stage. The first stretch is identical with the coast road, but branches off to the south about 30 miles from Algiers. The coast road continues east to Tizi Ouzon, about 60 miles, the last 15 of which are rather winding and encompassing a number of sharp grades.



5—The natives were astonished at the appearance of the tourists



6—There were a few formalities necessary outside of Biskra's walls



7—The natives and their families insisted upon being given a ride

present is represented by the same valleys in the Tell that have been granaries since the time man first required grain.

An automobile tour through the Tell, while interesting and in a certain sense unusual, is not sufficiently so to make the journey worth while. But if the tourist wishes to enjoy something really unique he may tour from the city of Algiers to Biskra, an oasis in the sebkhas, less than 200 miles in a direct-line, but by the military roads the distance is nearer 450 miles.

Leaving Algiers, the road east, following the sea coast, is magnificent for 50 miles. It was once the main military artery in the French scheme of occupation and traverses a country that resembles the soil and general appearance of the north Georgia mountains and in January is not unlike that portion of the United States in September or October.

The country traversed is devoted to grape culture to a large extent and is delightfully attractive to the eye and senses.

Tizi Ouzon makes a good luncheon stop for the first day and the facilities to be found there are ample. The afternoon run is rather long, but the road surface is so perfect that little difficulty will be experienced in getting to Bougie in ample time for dinner. The afternoon run from Tizi Ouzon is largely up grade, with a few steep hills to climb and from the summits of these successive ranges, glimpses of the blue Mediterranean can be caught. For one long stretch before reaching Bougie the road ascends a 3 per cent. grade so evenly that it is difficult to tell while running whether the car is going up or coming down.

Bougie is an ancient seaport and has a most interesting native



General view of the oasis of Biskra from the opposite side of the river

quarter which will repay investigation by the tourist. Gasoline costs 33 cents a gallon at Algiers and gradually increases the further one gets away from the railroads. The roads are rather narrow, ranging from 10 to 14 feet. Like the best military roads, they were constructed with small regard for labor. There are some spots where they wind tortuously through canons, but as a general principle the engineers constructed them with the idea of making the passage of artillery as easy as possible. This accounts for the long, gentle and almost inappreciable grades such as the one entering Bougie.

All along the coast from Algiers to Bougie the road leads through vineyards which have taken the place of grain fields to a considerable extent. The grapes of Algeria have a world-wide reputation and are in demand wherever they may be shipped.

Let no tourist undertake this journey without a camera and plenty of plates and films, for each hour of the way will afford opportunity to take pictures of extraordinary interest and beauty.

There will be no trouble experienced in missing roads in northern Algeria. In the first place the roads themselves are infrequent and the main highways cannot be mistaken. The occasional cross-roads are usually marked and as a consequence there is little probability of losing the road. The hotels are surprisingly good along the coast.

The next stage of the route is to the ancient town of Setif. This place lies a little east of south from Bougie and is located about the center of the fertile interior plateau in the northern section of the country.

The roads are similar to those encountered in the run from Algiers, but as they ascend toward the foothills of the Atlas mountains they are narrow and winding.

The run from Setif to Biskra may be made in one day, but it is advisable to cut the itinerary in two so as to take in the city of Timgad, which was used for centuries as the headquarters of the desert hordes which made periodic descents upon the constituted authorities, native, Turkish and French.

The tourists must retrace their course along the road to Lambese and Batna before regaining the ascending trail across the Atlas range. In this particular section the mountains are called the Aures. East of the pass El Kantara through which the travelers go, the craggy steeps tower into the sky and set up a barrier that is entirely impassable to automobiles, but the road to be followed is good clear to the summit. It winds southwestward around the foothills and then enters the pass of El Kantara, a canon, the walls of which almost shut out the daylight they are so high and stand so close together. This was the pass once captured by the Romans that was held for 300

years by one small tribe of Kabyles against the assaults of all other tribes and the military operations of the Turks and Europeans.

On the northern side of the pass the climate is laden with the adequate moisture from the breath of the sea. The hills are covered with verdure; the vines hang heavy with luscious fruit and the fields bear luxuriantly. But as soon as the summit is passed and the travelers emerge on the south side of the pass the whole scene is metamorphosed. The same transition has taken place that is so noticeable in crossing the Cascade mountains in Washington and Oregon. At Portland or Seattle the climate is moist and the natural verdure is almost sub-tropical, but east of the Cascades it is as dry as the Sahara, the reason for this marked difference in climate between sections that are adjacent is the same in Africa as it is in the United States. The rocky wall of the Atlas mountains serves as a barrier for the sea breezes. The cold peaks precipitate the moisture when the winds from the Mediterranean touch them, but the rain falls on the northern slope and whatever portion of the north wind succeeds in getting over the range has been stripped of its life-giving moisture.

Thus the country south of the pass looks like eastern Oregon. Sagebrush, or something closely resembling that plant; greasewood and heather are about the limits of vegetation. The air is dry and the climate has all the characteristics of the desert.

But there is one material difference between this section of Algeria and that of say, southern Arizona. The geology of the country is such that springs are frequent, even in the desert. The bed rock lies close to the surface and where minor faults occur the water flows out of the ground.

The marvel of nature is seen where this happens. On all sides the yellow barren sand gives no promise of life, but where these little springs flow forth the desert blossoms into an oasis. Date palms, gracefully nodding in the soft breeze, are typical of the oasis and wherever the water flows, the sand produces abundant vegetation. Cattle, camels, goats, sheep and horses have thriven for centuries on the fodder provided by the desert springs and clear to the edge of the great, arid Sahara, the oases support a large permanent population.

Oases range in size from an acre of isolated palms, sufficient in size to support a single family, to garden spots 12 or 15 miles in diameter, entirely surrounded by dry sand and having no apparent inlet or outlet for the spring-fed ponds and lakes with which its surface is dotted.

The city of Biskra, with its considerable population and its array of shining white buildings, is situated in the midst of such an oasis, which is reported to hold 150,000 palm trees.

Just after leaving the mouth of the pass a new bridge has been constructed to carry the road across a deep canon. This bridge recently has been finished and is a vast improvement over the former method of covering this section of the road.

The accompanying pictures indicate something of living conditions as they are found at Biskra. The oasis is extensive and besides the Kabyles, Turks, negroes and Bedouins there are many Europeans. Some fine residences have been erected by French noblemen at Biskra, which are used for homes from 7 to 9 months in the year.

The military road system of Algeria comprehends two complete parallel lines of road. The first extends generally along the coast from Oran to Tunis. The second skirts the hills from 30 to 40 miles back from the coast. Between these two lines there are cross-roads at irregular intervals and a third line of parallel road has been partially finished.

Extending south from the main sea-ports are roads that penetrate the second mountain range and in the case of the road by which Biskra is reached, the road continues out into the desert as far as Tougourt. This is the same road that starts south from Bougie and the large city of Constantine. The longest southerly road leading directly from Algiers passes through Chiffa and Medea; climbs the mountains through a gorgeous pass and strikes south through Boghari and El

Krachem to Lagouat and finds its terminus deep in the Sahara at Ghardaia. Another road from Algiers runs through Arba and Aumale to Bou-Saada, a small place in the northern foothills of the Oulad Nail.

A tour of Algeria may well occupy a whole winter but the more interesting points may be covered in from 4 to 6 weeks. There are several ways of reaching Algiers from the United States, but all of them require transshipment of the car. Steamer lines from the French Atlantic and Mediterranean ports are probably more direct than others. The cost of shipment is in the neighborhood of \$125 from New York. Gasoline at its cheapest is twice as dear as it is in the United States and good oil is scarce and costly. If the party contemplates going away from the regular automobile routes, provision had better be made for supplies of fuel and oil, as it would be very annoying, and perhaps dangerous to run out of them in the desert.

A party of tourists who have been making the rounds of Algeria, requiring a period of six months to do so, give some interesting details regarding automobile travel there. The cost for shipping a motor-car from Southampton, England, to Algiers is \$70, besides \$5 for unloading at Algiers. The Algiers shipping authorities extend satisfactory courtesies; although the reliability of the Arab assistants is not by any means certain, these not exercising the least concern over missing tools or seawater in the radiator. As a rule, the hotel accommodations are excellent. Signs are displayed notifying automobilists that garages are maintained, and also that this or that particular hotel is recommended by The Automobile Club of France. It is not difficult to obtain petrol in any village. The roads of southern Algeria are very carefully made, a great roller, drawn by many teams of mules or horses being used. The quality of the work compares favorably with that which is done by a steam-roller.

A Budget of News From Australia

SYDNEY, N. S. W., Nov. 26—Since February of this year trade has grown to a very considerable extent, so much so that those who profess to be any authority predict that a crisis is near at hand and many agents, especially those recently started, may go out of business. As was said nearly a year ago, every leading European car had an agent here and others starting had to look to America for their lines, and the result has been that almost every car advertised in THE AUTOMOBILE is now represented on this market as well as several other makes, and our population is only 4,000,000 and cars costing much more here than abroad, it is difficult for agents to live up to their contract numbers, and in the end it means someone is going to lose a lot of money, and also there is going to be a large number of cars thrown on the market, and having this end in view, some of the older agents are intending to cut the prices and bring this crisis about early and avoid as much as possible the glutting of the market.

Second-hand cars are a bad proposition in this country and an illustration was given when the General Motor Co., Ltd., went into liquidation on account of serious customs frauds perpetrated by the managing director, who is now undergoing a term of imprisonment for the same. At the liquidation sale a large number of second-hand cars were offered, but although the sale was well advertised and some of the cars were well known, and also of well-known makes, the prices realized were terribly low, and brought only 60 per cent. of expert's valuation, while on the other hand new cars brought within 3 per cent. of the list price. These cars were the Renault and the British Wolseley.

Although the high-priced European car has a good steady market, American cars also have a good market and numbers of Hupmobiles, Fords, Overlands, Chalmers and Cadillacs are to be seen running along the streets, whilst other makes which do not have such pushing agents are also to be seen.

In speaking of pushing agents it might be mentioned that agents of the Hupmobile, Overland and the Hudson were doing a good trade in high-priced British and French cars previous to their taking up any American agency, but since taking American cars they are advertising and pushing the American cars for all they are worth and never mention their European cars.

There is a good trade to be secured in this country by the first maker who introduces a good light delivery van to carry loads up to about 1000 pounds, and such vehicle must be reliable and low cost to purchase, not exceeding \$650 in America. As fuel is a costly item here, an economical carbureter is necessary. Air cooled engines will not have any demand, but the car which has solid tires, if only on the back wheels, will also assist the selling. The type of body does not matter, in fact no body at

all is the best, as most users are sure to have a particular idea of their own as regards body work, and not only that, the duty on body work is heavy, 30 per cent. ad valorem, whilst the chassis is only dutiable at 5 per cent.

To give an idea of what is required in this line, the Greater J. D. Williams Amusement Company, which company is the leading moving picture enterprise in this country, is using a Brush car fitted up to carry a few hundredweight.

There is also another line that could be pushed in this country and that is stationary engines suitable for farm work. Most farmers are using the expensive English oil engines and on account of their heavy weight they render themselves a little unsuitable for shifting about, while a light gasoline engine will be more suitable, and already there are several lines on the market. Apart from those sold by the International Harvester Company, the Ferro engine is doing well, but there is no reason why lines of this description should not take the entire place of the heavy and clumsy engine.

Sundries of American make are slow in making their appearance in spite of the advice given in THE AUTOMOBILE some 6 months ago, and what is really required is a good distributing house to introduce useful lines, and have them properly represented to realize a good return on the investment.



The camels contemplate their successor with placid mien

Industrial News by Mail and Wire

SOUTH BEND, Dec. 26.—J. M. Studebaker, Sr., who for 54 years has been vice-president or president of the Studebaker Brothers Manufacturing Company, has resigned to become chairman of the board of directors of the Studebaker corporation, which was organized in the latter part of February, with a capital of \$45,000,000.

Frederick S. Fish was elected president of the corporation, Clement Studebaker, Jr., was chosen vice-president and chairman of the executive committee; A. E. Erskine, treasurer; Frederick P. Delafield, of New York, special counsel, and Scott Brown, of this city, general counsel and secretary.

J. N. Gunn, of New York, was appointed general manager of the corporation, co-ordinating the administration of the automobile division, the horse-drawn vehicle division and the harness division of the business. The other officers of the corporation remain as before.

News of Detroit Factories

DETROIT, Mich., Dec. 26.—C. C. Hildebrand, assistant general manager of the Chalmers Motor Company, who has just returned from a tour among the Chalmers dealers that embraced the entire country, is most enthusiastic over the outlook for the coming year and is quite satisfied with present conditions for the season of the year.

"I have never known the prospects for the industry to be any better," he said. "In all parts of the country Chalmers dealers report business far ahead of last year and indications for the spring are certainly very encouraging. A great many of our dealers have already sold from 80 to 100 per cent. of their 1912 allotment, and the demand for additional cars is general. I was especially surprised over the business being done in the South, and when the South gets better roads it is going to be a great field. And down in Cuba the motor car is becoming more popular every day. The island is beginning to literally swarm with them. This has been the biggest December in the history of the Chalmers Co. Our sales for the month to date are more than 250 cars ahead of last December."

Employees of the Chalmers factory had material evidence of the company's prosperity in the form of an extra week's pay, which was handed them Friday noon as a Christmas remembrance. Every factory hand who had been in the company's employ for six months or more and every member of the office force who had been with the concern a year or longer was a beneficiary in this distribution of Yuletide cheer.

The Hudson Motor Car Co. also took a hand in the Christmas giving, providing 17 poor families with substantial dinners to-day and all the clothing that was needed.

The Studebaker Corporation has come into actual possession of the factory at Port Huron, now known as plant No. 2, where for the past five years rear axles for the E-M-F "30" and Flanders "20" cars have been manufactured, together with eleven lots. The property was originally donated to the Northern Motor Car Co., which was one of the companies that were merged to form the E-M-F, on the condition that it be used for the manufacture of automobiles or automobile parts. When the plant had been occupied five years the Port Huron Chamber of Commerce was to turn over the deeds, provided the firm occupying it had paid out \$200,000 in wages. The time limit expired several days ago, and the company having fulfilled the other conditions there was nothing for the Chamber of Commerce to do but turn over the deeds, which it did cheerfully. The plant now employs 500 men and has been one of the main industries of the Tunnel City for some time.

The Argo electric brougham, manufactured in Saginaw, made its first appearance in Detroit Saturday and attracted no little attention. It is a low-hung car with sweeping lines. It has a steering wheel instead of a lever, a direct herringbone gear drive, chainless and noiseless, and the Argo combined speed control and brake. George Waller, sales manager for the Argo, is in the city to arrange for an agency here.

Case Company to Change Form of Name

RACINE, Wis., Dec. 26.—It is reported that the J. I. Case Threshing Machine Co., of Racine, Wis., the largest industry of its kind in the world, and for some time manufacturing motor cars, having purchased the Pierce Motor Co., of Racine, will reorganize immediately after January 1, in order to greatly extend the scope of its activities.

The name is to be changed to the J. I. Case Co., and new lines of machinery and implements will be produced. It is reported that the extension of activities will include the entrance into the motor truck and farm tractor field.

Alco Truck as Aid to Santa Claus

A 3-ton Alco truck, equipped with solid tires, has been engaged this week in one of the most trying endurance tests that ever has been attempted in demonstrating the enormous capacity for work of a commercial vehicle.

The truck was placed in service Monday to aid the Adams Express Company in handling its Christmas business. It ran night and day for 125 hours. The crew of drivers and helpers was changed every few hours.

In one stretch of 24 hours the truck carried 120,000 pounds of goods, making twenty trips.

Franklin to Continue Some Branches

SYRACUSE, N. Y., Dec. 26.—Contrary to the announcement made in certain sections that the Franklin company was about to abandon all its extensive system of branch houses, following the changing of the form of agency in New York and elsewhere, the company declares that the intention is to maintain such branch houses as those in Chicago, San Francisco and in other centers of general distribution.

The reason for the abandonment of the branch houses in New York, Boston and several other Eastern cities is that under the present selling plan of the company the necessity for fully equipped branches has ceased to exist and the business can be handled with more celerity from the factory itself.

Hewitt Heads New Truck Company

Edward R. Hewitt has been elected president of the recently incorporated Hewitt Motor Company, and R. C. Gildersleeve, formerly general manager of the truck department of the Metzger Motor Car Company, has been elected secretary and treasurer.

The company was incorporated for \$1,000,000 to extend the manufacture of the Hewitt truck. This car has been made by the Metzger company since about two years ago and is used to a considerable extent in New York for handling coal and other bulky freight. The new company has secured the Metzger interests in the truck and is installing a factory in a six-story concrete building at West End avenue and Sixty-fourth street.

According to announcement the company plans to make a specialty of its service department, which will be coincident with the factory. Mr. Hewitt is now engaged in purchasing machinery which will be installed next month. The directors of the company include M. F. Burns, of Burns Bros., coal operators of this city, the largest users of Hewitt trucks in New York; E. C. Converse, William E. Corey, E. R. Hewitt and Ambrose Monel.

Hope for Champion Wagon Company

In the United States District Court of Northern New York an order has been entered recently appointing Theodore D. Gere and Fred C. Hill, of Owego, N. Y., as receivers for the Champion Wagon Company. Mr. Gere is general manager of the company.

The company has been in financial difficulties for some time and suspended manufacturing operations last month. An immediate effort was made to compound the debts of the company and to keep it running until a plan for solvent reorganization could be discovered and adopted. In an official announcement to the creditors and stockholders Mr. Gere states that the general creditors are willing to discount their claims fifty per cent. in case a reorganization can be effected.

A meeting of the bondholders has been called and the hope is expressed that the receivership will be only temporary.

Klaxon Enjoins Rubber Company

The Lovell-McConnell Manufacturing Company of Newark, N. J., recently brought suit in the United States Circuit Court for the Southern District of New York for alleged infringement of the basic Klaxon patents, 923,048, 923,049 and 923,122, by Henry Phillips.

Mr. Phillips conducts his business under the name of the H. Phillips Rubber Works at 1931 Broadway, New York City. Mr. Phillips, according to the complaint, infringed those patents

by cutting prices and otherwise violating the terms of the license set forth on the tags, sealed to every Klaxon and Klaxonet before it is put upon the market. The case came before Judge Ward for hearing on motion, and a preliminary injunction was granted.

Duryea Sells Out; To Form New Company

SAGINAW, MICH., Dec. 26—C. E. Duryea, who recently resigned from the presidency of the Duryea Automobile Company, has announced that he and others will form a new company in the near future to manufacture pleasure cars exclusively. Mr. Duryea is seeking a suitable site for the manufacturing plant.

The settlement of the difficulty that had arisen between Mr. Duryea and the old company was brought about by the sale of his stock to C. C. Brooks. The concern under the direction of F. G. Palmerton will continue to manufacture commercial trucks.

Bennett Promoted in Overland

TOLEDO, OHIO, Dec. 27—George W. Bennett has been appointed vice-president of the Willys-Overland Company, the promotion from the position of sales manager to a berth next to president John N. Willys being made Dec. 20. Mr. Bennett is a veteran in the motor industry and for years was sales manager for the Rambler. Then he joined the Knox forces and after a brief stay with that concern he assumed the managership of the New York White branch, from which position he went to the Overland company.

Penn Unit Machinery Sold to Junk Men

ALLENTOWN, PA., Dec. 26—The plant of the Penn Unit Automobile Company has been sold piecemeal, realizing \$45,000. It is said that the property cost upward of \$200,000. Most of the machinery was bought in by junk dealers and the real estate went to T. E. Ritter.

Touring Club Plans Southern Tours

TO MEET the increasing demand for the latest and most accurate road data in the Southern States, a path-finding trip under the direction of the Touring Club of America will start within a fortnight from Augusta, Ga., going to Nashville by way of Atlanta and Chattanooga. This trip, which will cover upward of 600 miles, will be made under the direction of the Southern Vice-President, D. D. Armstrong, of Atlanta.

An interesting feature of this scouting trip will be the charting of one of the most delightful Southern routes, which will be taken by a large party of motorists and good roads enthusiasts early in February to attend the automobile show to be held in Atlanta, Ga., in the Auditorium-Armory from February 10 to 17 under the auspices of the Atlanta Automobile and Accessory Association. Parties are now being formed in many of the cities along the route and the forthcoming tour, as a preliminary to the South's big automobile exposition, will be the greatest demonstration that has yet been given of the increasing interest throughout the South in automobile progress and the need of improved highways.

This path-finding run, with which the Touring Club of America will inaugurate the campaign of 1912, is but one of a series of similar road scouting trips through the South and other parts of the country which will be made within the next few months to secure road data for the Automobile Blue Book, the official guide of the Touring Club of America. The Augusta to Nashville tour will greatly enlarge the road and touring material acquired by the Touring Club.

The road from Nashville to Chattanooga with the exception

of one short stretch, which will be improved before the Atlanta Automobile Show tour starts, is in very good condition. The Chambers of Commerce, Boards of Trade and civic organizations along the route are showing a keen interest in this good roads demonstration and ample assistance toward improving many sections of the highway has been promised.

Mr. Armstrong will have the co-operation of J. M. Waite, one of the leading good roads boosters of Nashville, and Houston Harper, of Chattanooga, manager of the Touring Club's branch in that city, who will have general charge of the preliminary work in their respective cities and will make arrangements to receive and properly entertain the motorists traveling to the Atlanta show early in February.

It is not improbable, providing weather conditions will permit and the roads are found to be available for touring, that the scouting party instead of terminating the trip at Nashville will continue to Memphis and New Orleans by the way of Birmingham, Meridian and Jackson.

A more desirable route to New Orleans has been sought by many motorists as that city is visited annually by thousands of travelers, especially during the Mardi Gras festivities. It has even been suggested by several prominent automobilists and good roads advocates that a popular tour to New Orleans under the auspices of the Touring Club might be organized for that novel and world-renowned celebration.

From New Orleans the Touring Club's representatives will return to Atlanta, visiting Mobile, Montgomery, Ala., Columbus and Macon, Ga.

News of Shows, National and Local

SOME 300 men representing two score trades were put to work in Madison Square Garden, Thursday, for the Twelfth National Automobile Show, which opens Saturday night, January 6.

W. W. Knowles, who is in charge of the work of decorating the Garden, has groups of men at work in all parts of the big amphitheater and they are to labor night and day up to the opening hour of the show. Gangs of iron-workers are now installing the big girders which are to support galleries.

Practically all of the sculptor work and the scenic paintings which will be used in the decorative settings for the exhibits are now ready to be set in place. Carpenters and wood workers are engaged in the construction work of the booths and ornate wood effects.

The arena floor was put down several weeks ago. In a vacant office building in this city more than 200 women are sewing together the carpet which is to be used to cover the space of the exhibits. Twenty carloads of furniture which is to be placed in the booths of the exhibitors has been delivered at the Garden. Two monster elevators which are to be used to hoist the cars and accessories to the balconies will be installed in a few days.

Last week, while the roosters were crowing on the main floor during the poultry show, men were at work in the basement cleaning and painting and covering the walls and pillars with old-gold paper. The basement, with its bodega set in Southern California scenery, is practically finished.

The exhibition hall, which is to represent a realistic outdoor Spanish garden, is now receiving the attention of the decorators, as is also the Japanese cherry garden, which will be the theme of decoration in the concert hall.

The Garden will be opened daily to the general public from 11 a. m. to 11 p. m. During Part I the garden will be open from noon, Friday, January 5, to 6 p. m., January 6, for the installation of the exhibits, at which hour these will be in place. No exhibits or goods will be admitted into the building after 6 p. m., Saturday, January 6. All goods will be received and shipped from the Garden at the corner of Twenty-seventh street and Fourth avenue. No goods will be permitted to be brought into or removed from the building from any other entrance. A clerk will be stationed at the entrance of Twenty-seventh street and Fourth avenue to check in all receipts of goods.

Grand Central Palace Show Final Plans

While it has been customary for the promoters of automobile shows to expend thousands of dollars on decorative features, the coming event at the Grand Central Palace, which opens to the public at 8 o'clock on the evening of January 10, will not be one whit behind anything ever attempted in this city in the line of beautiful setting.

To persons accustomed to the gloom of the old building at Forty-fourth street the new structure, which is in every way deserving of the name given it, will prove a revelation. It is one of the most beautiful things, from an architectural viewpoint, in New York. Its massive columns, beautiful marble trimmings, hard maple floors and accompanying splendor are probably of higher class than have ever been attempted in a building of the size and designed for the same purposes.

The management of the coming show, attended by the best scenic artists of the city, spent a great many days figuring on the scheme of decoration and equipment, agreeing after every

session that to attempt anything of the sort would be akin to painting the lily. As a result of these deliberations there will be placed in the Palace nothing of the gaudy material usually designed to cover the unsightly spots of public buildings—nothing, in short, which can be properly described as anything short of the finest forms of artistic production.

Mural paintings will predominate. They will be used liberally, but rather because the public expects this sort of thing in connection with an automobile show than because it is a necessity. The moment one enters the building the effect will be that of an Italian garden. The main floor is approached by means of a flight of marble steps, 60 feet in width, decorated with brass railings and trimmings and ornamented for the occasion with bronze emblems, typical of the progress of the industry and growing palms of great height and size. On the center of the floor, where the exhibition spaces are large and will contain some of the finest productions of the industry, there will be absolutely nothing in the form of decoration, except the necessary signs, on which a great deal of care has been exercised, and the floor covering, which is of wood carpet, so made and laid that it may be cleaned and polished every night after the show has closed.

There will be none but passenger cars in these sections. The scheme of decoration commences at the walls. Every window is to be draped, to exclude the glare of light inseparable from a building so liberally furnished with windows. The space between the windows, extending to the ceiling, will be entirely hidden by paintings by one of the city's best scenic studios.

Some of these paintings are of mammoth size, as, for example, a canvas 60 x 50 feet, depicting the effect on a herd of centaurs of the appearance on the scene of a modern motor car. This work of art will perhaps be the most interesting study of the collection. These spaces will be occupied almost exclusively by passenger cars, though there will be a couple of the more important exhibits of commercial vehicles also, and care has been exercised to harmonize the color scheme with the bodies of the cars to be shown.

The second floor has been similarly treated, so far as walls are concerned, but around the front of the balcony will be placed fifty or more marble vases filled with poinsettias and green foliage. The center of the third floor is separated from the main building by trellis work of great size, which will be completely covered by foliage and flowers, the whole presenting a scene of rare beauty, viewed from any direction, but especially from the main entrance and lower floors.

The size of the Palace makes it particularly desirable for the holding of an exhibition of the kind. It has a greater amount of exhibition space than any other show building in America. The exhibits at the coming show will cover 138,000 square feet of space.

The noisy demonstration of horns and other alarms which have characterized some of the automobile shows of the past will be absent at the show. The management has made a rule that no horn will be permitted to enter until its reed has been removed and that no other form of alarm may enter the building until it has been so altered that no sound can be emitted by it. Exhibitors have shown a disposition to obey the rule, regardless of any further action by the management, by written assurances that they will follow the rule in letter and spirit.

One of the difficulties heretofore experienced by automobile show promoters has been keeping the floors of their buildings free from dirt. The enormous crowds constantly walking over the carpets have left indelible stains which have been unsightly.

This will be overcome at the show at the Grand Central Palace. A floor covering is to be used, consisting largely of wood painted to suit the coloring of the cars, which will be washed and repainted after the close of the show each night, so that the floor will at all time be inviting and in keeping with the magnificent details of the remainder of the building.

For the first time in 7 years the people of New York and the thousands who come to New York for the annual automobile shows will be able to examine all of the cars of importance made in this country the same week. Heretofore trade rivalry made this impossible. The show at the Grand Central Palace has for several years been held a week ahead of the Garden show in the hope of getting first attention at the hands of the public and the press. This year the strenuous rivalry that has heretofore characterized the shows is absent. Patent suits have passed into oblivion and the only reason two shows are to be held is that no one building in New York is large enough to accommodate all of the manufacturers.

Many thousands of people will obtain their first glimpse of the new Grand Central Palace. To those who still have the old building of the same name in mind, the new structure will prove a revelation. It is located two blocks north of the old Palace, at Lexington avenue and Forty-seventh street.

Quakers to Show Amid Splendors

PHILADELPHIA, Dec. 26.—When the doors of the First and Third Regiment Armories are simultaneously thrown open for Philadelphia's eleventh annual automobile show on Saturday evening, January 13, an attraction second in interest only to the exhibition itself will be the decorative scheme employed, without a doubt the most pretentious thus far conceived for a Philadelphia show. Charles T. Ashman, whose departure from time-worn methods formerly used, scored a hit last year, will again have charge of this feature.

The Third Regiment Armory, Broad and Federal streets, will depict a scene in the forest of Fontainebleau, France, the main decorative fabric along the eastern side of the building showing the depths of the forest in an autumnal sunset, approached from either side by a drive, representative of the road from Paris, in which driveway will be pictured automobile parties on their way to the forest. The north, west and south walls will be a series of panels presenting French scenes. As was the case last year, all unsightly woodwork and obstructions will be cleverly concealed and by suspending from the ceiling by means of an invisible wire, the individual signs designating the various exhibitors' booths, impediments to an otherwise sweeping view of the whole room will be eliminated.

At the First Regiment Armory, Broad and Callowhill streets, a scene will be presented of the approach to the Castle of St. Elmo, embracing a panorama of the Bay of Naples, the Italian Riviera, Mt. Vesuvius, Sorrento and the island of Capri. The side-walls will be decorated in balustrade effect, supported by a stone wall, overgrown with moss and plants, and dotted with trees.

The color scheme will be carried out in harmony with the surroundings, and as at the Third Regiment, suspended electric signs will be employed so as to furnish an uninterrupted view to visitors.

Rhode Island Show in Palm Garden

PROVIDENCE, R. I., Dec. 26.—A particularly attractive decorative scheme has been worked out for the interior of the State Armory, Providence, during the week of the automobile show to be given by the Rhode Island Licensed Automobile Dealers' Association January 22-27, inclusive. The exhibition, which is the first in three years within the state, promises to be a record-breaker.

The general effect will be that of open-air palm garden, and

an azure sky will be manufactured out of cloth, hung just above the girders of the shed.

All of the exhibition space has been rented.

In the upper, or main hall, the pleasure vehicles will be shown. The basement hall, where the artillery companies are quartered, will be used for commercial vehicles and accessory displays. Forty-three different makes of pleasure vehicles will be shown in the main hall and sixteen styles of commercial trucks or delivery wagons will be found in the basement section.

Bird Concert at Syracuse Show

SYRACUSE, N. Y., Dec. 23.—Automobiles worth \$500,000 and \$150,000 in accessories will be represented at the third annual show of the Automobile Dealers of Syracuse at the State Armory in March. Every exhibitor will be expected to insure his display; and a wise precaution, worthy of general imitation, is a requirement prohibiting any gasoline or explosive in the hall. Machines running thither under their own power will be required to have their gasoline siphoned out before being taken inside.

There will be an immense fountain, electric showers of lights in fine designs and the "bird symphony." The latter feature is borrowed from the recent industrial exposition here. From the center of each first floor booth will be suspended a birchbark basket cage containing a canary bird, all picked songsters. The success of this "concert" at the former affair has dictated its repetition.

Space Allotted for Boston Show

BOSTON, MASS., Dec. 26.—Chester I. Campbell, manager of the Boston automobile show, who is just back from a tour of the European shows, says that he did not see anything there in the line of decoration and arrangement that seemed original enough to be adapted to the Boston show.

Now he is busy with the plans for the March show, which this year will last two weeks, the pleasure cars being housed in Mechanics' building the first week and the commercial vehicles the second week. Practically all the space has been allotted and the dealers are able to get some idea of how much room they will have in which to show their models.

Detroit Space All Under Contract

DETROIT, Mich., Dec. 26.—Space in the Wayne pavilion and temporary annex, for the eleventh annual automobile show of the Detroit Automobile Dealers' Association, is now all assigned, the final drawing having taken place last Friday night.

There were forty-three applicants for the 10,000 additional feet of floor space afforded by the annex, and most of them were taken care of, although some of the exhibits will be somewhat cramped. There was a large representation of motor car manufacturers at the drawing and this branch of the industry will make a very creditable showing at the exhibition.

Work on the annex will be started next week, and will be rushed.

Atlanta Show Will Be February 10-17

ATLANTA, Ga., Dec. 26.—The Atlanta Automobile and Accessory Association will hold its first automobile show February 10 to 17, in the local Auditorium-Armory, where the first and only national Southern show was held a couple of years ago.

As a result of a series of meetings it was decided to hold the show and to pay for it by charging exhibitors 50 cents a square foot for all space used. This, it is estimated, will pay all expenses. Then all receipts from other sources will be divided among the exhibitors.

The committee appointed to arrange for the show was H. G. Moore, manager of the Atlanta Velie Branch, chairman; W. D. Alexander, of Alexander-Seewald Co.; D. T. Bussey, of the Georgia Motor Car Co.; Charles L. Elyea, of the Elyea-Austell Co.; F. T. Long, manager of the local Cole branch; John E. Smith, Pierce-Arrow agent; Wyllie West, manager of the Firestone branch, and Frank P. Day, manager of the Locomobile branch.

The committee is now soliciting the field and expects within a few days to sell all available space. In the meantime a manager will be appointed and actual work begun.

The curbstone brokers, against whom there has long been a bitter feeling in Atlanta, will be barred from the show and no cars except those represented by members of the association will be allowed in the exhibit.

Sliding Space Scale at Baltimore

BALTIMORE, Md., Dec. 26.—A. S. Zell and H. M. Luzius, constituting the committee on floor space for the Baltimore show to be held in the Fifth Regiment Armory, February 20 to 28, inclusive, under the joint auspices of the Automobile Club of Maryland and the Baltimore Dealers' Association, plan to have three sizes of floor space. These will be the minimum, intermediate and maximum. The dealers will be notified to file applications before January 20.

After that date the space in the Armory will be reckoned with that required by the dealers and if the Armory floor is not large enough, each applicant will be reduced on a percentage basis. The dealers will then be notified of their spaces and also the date for drawing.

Show at Canadian Capital

OTTAWA, Dec. 26.—The Ottawa Valley Motor Car Association is working hard to make its first annual automobile show a great success. Already nearly all of 40,000 square feet available has been sold and the exhibition promises to be complete in every detail.

Canada's crack band, the Governor General Foot Guards Band, of 50 pieces, will furnish music. The opening promises to be an event. The House of Parliament will be in session during the week and the fact of nearly 500 members of the house being here at that time, from all over the Dominion of Canada, appeals greatly to exhibitors, as many customers and prospective buyers of automobiles will be tempted to attend the show.

Particulars in Lozier Cases

A sharp check has been given to the proceedings filed by Fletcher R. Williams and Joseph L. Rhinock against the Lozier Motor Company, charging breach of contract to sell control of that company. The New York Supreme Court has entertained a motion to require the plaintiffs to file bills of particulars in the actions, specifying the nature of the contract and all its circumstances.

It was planned to have the cases tried on their merits this month, but the court order requiring amendment to the complaints may have the effect of deciding the case in the Appellate Court as the attorneys for the plaintiffs have the right to appeal from the order of court to file bills of particulars and the upper court may then take jurisdiction of the matters on the law point raised.

According to the attorneys for the Lozier Company this will probably be the result. Under the circumstances the plaintiffs are ordered to file the particulars immediately or take appeal and the latter course is considered more likely. The pleadings so far submitted tend to show that Williams was not the sole financial man involved in the alleged contract of purchase, but that George B. Cox, of Cincinnati, was also interested. Rhinock figures as an agent in the suit.

Arrangements are being made for special nights with special attractions. Manager Louis Blumenstein is busy allotting space. The decorations will be in the handsomest and most striking that can be obtained.

Hudson Terminal as Show Place

Down in the concourse of the Hudson terminal building in sight of thousands of Jersey commuters the Abbott-Detroit Motor Company has placed an Abbott-Detroit car of latest model and a Regal colonial coupé. The two cars attract much attention and have provoked many inquiries.

News of Other Local Shows

DENVER, COL., Dec. 26.—Plans for the Denver automobile show, which will be held in the Auditorium March 4-9, are being rapidly matured, and from present indications the exhibits will exceed those of any previous year. So heavy is the demand for floor space that it will probably be necessary to build an additional display room in the street adjoining the Auditorium. The Studebaker exhibit will be sent to Denver entire from the New York show and other dealers are planning special features which will not be ready for announcement until later.

ELMIRA, N. Y., Dec. 26.—The second annual show will be held at the State Armory, February 26 to March 2. The entire main floor space has been sold and 34 different makes of cars will be shown. Great interest is being taken in the forthcoming show. One of the features will be the decorations. The entire basement will be given over to accessories. Louis Blumenstein has been appointed manager.

SIoux CITY, Ia., Dec. 26.—The Sioux City automobile show will be held from February 26 to March 2. The date was chosen at a meeting of the Sioux City Automobile Dealers' Association, last week. This date was selected as it follows the Omaha and Minneapolis shows, and precedes the Des Moines show.

TROY, N. Y., Dec. 26.—The Troy Automobile Club will hold its second annual show at the state Armory, Troy, during the week commencing Monday, February 12, and all indications point to it being one of the biggest and most spectacular events of this character ever held.

HARRISBURG, PA., Dec. 26.—The third annual automobile show of the Harrisburg Automobile Association will be held at the Arena February 3 to 10. There will be exhibits by automobile dealers and dealers in tires and automobile accessories.

Bars Unnecessary Noise

Chicago has placed the automobile horn in the same class with locomotive and street car signals by creating a law forbidding their use save as a warning of danger. Moreover, the city has taken another step forward by defining, for the first time in the history of municipal legislation, just what an adequate automobile signal is, by providing that no device shall be used as a signal of warning save that which gives an abrupt sound. This means that, no matter how much noise might be made with a warning signal, to make other than an abrupt sound will put it in the power of the court to fine any person guilty of unnecessarily sounding his signal \$25.

N. Y. Car & Truck Co. Declares Dividend

Creditors of the bankrupt New York Car & Truck Company will receive a small remembrance about New Year, as a dividend of 2½ per cent. has been declared by the receiver of the defunct company. The claims that will participate foot up \$151,000 and thus the amount to be distributed is about \$4,000.

One of the largest claims in litigation against the company is that of the Allen-Kingston Motor Car Company, which is suing for about \$25,000 for breach of contract.

Trials of the Non-Technical Scribe

HIS head was swirling in a seething mass of figures. They looked and felt like two dozen W. W. equilibrators somewhat tangled and bumping from one thought wave to another, and every bump jerked loose something in his delicate cerebrum. He was a reporter, just then, and he had been sent out to get a special story on "The Ambitions of the Automobile Industry." He had just emerged from ten minutes with Mr. Alpha, five minutes with Mr. Beta and fifteen hard minutes with Mr. Omega, these being the gentlemen who are duly appointed to say the first, the second and the last weighty word on the greatness of everything self-propelled. Handing out some nicely typewritten schedules to assist the faltering memory, each of them had managed to convey the impression that a great deal more was true than could be put into type and figures; these were simply safe, conservative estimates based upon a personal and thorough canvass. As for the future, the figures would probably be doubled in another year, as they were so much below the facts to-day. Ambitions? Oh, yes, he had asked about ambition. Well, what more could he want! Here it was.

"Suffering Amphotas!" exclaimed the young man—for the shrewd city editor always sends out a young, enthusiastic man when he wants an unvarnished story for a campaign review—"300,00 automobile wage earners in Detroit alone; a total invested capital of \$891,345,221.46; 197,315 motor vehicles produced in the fiscal year ending—well, would not that roll you over?—2,152,023 pneumatic India rubber tires aggregating a market value of \$186,245,789.20. Hold my hand! I am sure going to spring these numerals on O'Shaughnessy before they go to the desk."

O'S. turned out to be a United cigar clerk with orders to say "thank you as if he meant it" when handed good money. Privately he considered himself in training for a position as trust magnate and handled coupons with a fond, clinging touch. "Ben," he said, when confronted with the automobile magnitudes, "don't you try to hand out those figures for hot stuff. They are not in it with ours. Look here." And he pulled out a strip of cigar statistics from a notebook. The figures were decidedly longitudinal. "Take my word for it, Ben, old man, you are in wrong. Figures don't stagger anybody any more. I have turned loose these," and he waved the strip, "on lots of fellows who come in here. No go! And they are longer than yours. One fellow who buys twofers on Fridays and twofers quarters on Mondays just gave me the ha-ha. He said 'They have got machines now for turning out them statistics, I hear, and longer ones than that.' No, Ben, go and get another story."

O'S. was Ben's trial public, and Ben took the hint. What he handed to the city editor was something different. It was a chain of interviews with automobile owners, but it was never printed. "Put it somewhere else," the old man told Ben, handing him back the copy instead of shoving it into the hamper for superfluities; "it does not go on this sheet. What else have you got?"

Ben had conceived the brilliant idea of hunting up half a dozen young Tech chaps who owned automobiles, and his fraternity pin had eased matters along. "Whatever they think is the matter with the automobile industry it ought to be up to the automobile industry to change, and I can get my dope that way. I can't help it if they are not ambitious; they ought to be. Whoever heard, anyway, of any soulless industry having ambitions? It is the wrong cue." Ben was quite sure that the young chaps were just the right kind of persons. They did not care much for figures. "Lay figures" don't go with me," one of them said in his young technical pride—but they claimed to be very strong

on facts and they were exceedingly liberal in wanting things done differently. What they had told him was Ben's copy, and it was very long. "How near straight is it?" he was asked. "Too near," Ben replied with a droll tinge of sadness; "I don't know much about it myself, so I could not have prinked it up if I had wanted to. It's sure the voice of the public, if there is one." Old people do not count in Ben's estimation.

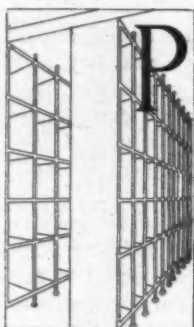
With liberal omissions, the gist of the remarks of his various authorities is condensed in the following: "An industry does not interest anybody except those who are in it or expect to get into it. It is the art of building automobiles and the progress in getting better and better results for the benefit of the user that interests the public. Some very fine problems are involved in making 10,000 automobiles with a capital of \$10,000 and making them all alike and selling them at a profit at \$1,000 for each and having each of them better than anything that could be bought for four times more money four years ago, and all those things. But there has to be division of interests in this world, just as there has to be division of labor, unless one is willing to split oneself up into atoms. An individual's interests cease distinctly when nearly all the things that are done are aimed at money-making for the other fellow and every improvement is pushed aside because it interferes with the regular routine of manufacture. The other fellow is vitally concerned, of course, as are all those who are to share in the profits. A little glow of satisfaction can even be derived from reflecting that the time is drawing nearer when every farmer and every expressman will be able to buy a car to help him out in his business. But every one can't be in these lines. Meanwhile it would be much more interesting to learn that, for example, a plan had been devised for doing away with the gasoline tank. Someone might get up a standard size of gasoline can—to hold three gallons, say—and have that sold all over like sugar, only sealed; and provide a couple of cradles with clamps for holding these cans in each car and an attachment with a nut and a pipe or anything to enable one to draw direct from either can. When one can was empty start drawing from the other and at the next stopping-place simply exchange the empty can for a full one. There would be decidedly less bother pouring gasoline or getting it dirty or full of water, and there would always be some on tap. The cans could be removed at home and the owner could store his car where he pleased without getting into trouble with the insurance people."

"No use," said Ben to himself, "to ask these people if the special machine tools which they get up for producing 10,000 cars in a series and at low price don't sometimes make better cars as well as more of them, but I will ask the next fellow, and if he makes another kind of a break I will take that up with the third man. When I get to the end of the string, I think I shall have something that way."

Hoosiers Raise License Rates

INDIANAPOLIS, Dec. 26—A new motor car license ordinance has been passed by the city council of Indianapolis and has been approved by the mayor. After January 1 the following fees will be charged annually: Three passengers and under, \$5; four passengers and over, \$8; private and public buses and delivery wagons and trucks of more than 1,000 pounds capacity, \$15; delivery wagons and trucks having a capacity of 1,000 pounds or less, \$10. The present license fee obtaining in the city of Indianapolis is \$3 for all classifications of self-propelled vehicles.

Reserve Parts Stock System



PRESUMING that the repair or service department of a company is organized and conducted rather with the object of increasing the comfort of the company's customers than to profit on the work of the department itself, the importance of an all-embracing system makes itself evident at once. A service department, if it would render quick and effective service, must contain several pieces of every sort of part used on the company's automobile. This sounds fine enough, but when one remembers that there are some 3,000 different parts comprising the make-up of the average automobile, the situation immediately takes on a different face. The man who has never entered in the stock room of the repair department has no idea of the amount of material stored and handled there, and what is most important, kept in good order. Unless he keeps this point before him, at all times, the vastness of his stock will avail nothing to the department head either and will not tend toward his success. It should never be forgotten that the service department is a small factory, and, as in a factory, space, time and labor must by no means be wasted in the process of conducting the business of the enterprise.

The principal difference between service department and fac-

How the New York Service Department of the Mitchell Motor Car Company Arranges Its Spare Parts to Advantage, with an Up-to-Date Inventory Always at Hand

tory lies in the part played by labor in both cases. In factory work labor is by far the most important of the three items named above. Even if space and time are not utilized as they should be, with a certain loss of labor as the result, this fact will hardly ever determine the success or failure of a factory's operation.

But in a service department the situation is different. Unless everything is kept in the most painstaking order, too much time will be lost in looking for the parts sought, with

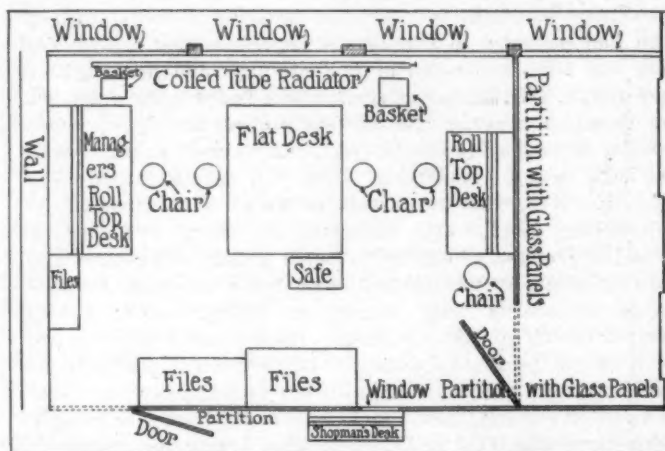


Fig. 2—The office of the stockroom is located adjacent to it and so furnished as to permit a maximum of light to find its way to the store-room proper

Water Pipes	Water Pipes	Water Pipes	Water Pipes
Nuts & Bolts	Fan Belts	Fan Belts	Pump Bearings
Pump Casings			
Water Wheels	Water Wheels	Water Wheels	Water Wheels
Strainers	Strainers	Fan Blades	Fan Blades
Fillers	Filler Caps	Drain Cocks	Fan Blades
17" long x 16" deep	17" long x 16" deep	17" long x 16" deep	17" long x 16" deep
Pump Casings	Water Pumps	Pump Gears	
24" long x 22" deep	24" long x 22" deep	24" long x 22" deep	
Fans			
38" long x 34" deep			
Radiators			
48" long x 28" deep			

Fig. 1—Arrangement of parts of cooling system in the Mitchell storeroom. The height here illustrated is full in proportion to the width

a consequently large loss of both labor and business. Lack of systematic arrangement has been the cause of failure for more than one repairer, whereas the introduction and maintenance of a thorough system has done much toward conducting a repair department without a loss, sometimes even at a profit, and producing a satisfied clientele in the case of many a successful company.

The Mitchell Motor Company, which has just moved its New York service department to 41 West Fifty-fifth street, has installed an adequate system there. Of course, some system had been used in the old quarters of the company's repair department, but experience showed that it could be improved in many respects, and when the department's location was altered the management used the occasion to introduce many innovations and improvements in their system of keeping the stock of repair parts in order. It had been found that an eternal inventory was a desideratum, but a system leading to it could not be introduced while still in the old quarters. Moreover, during the past few years many improvements in the arrangement of the parts had suggested themselves to the management. All these new ideas were carried out in the new building, and when the rush of work came on right after the place was thrown open to the Mitchell clientele, the increased efficiency which made itself felt at once proved the wisdom of the departures made by the management.

The offices of the stockroom and the parts storeroom are located on the fifth floor, and the arrangement of each is seen in Figs. 2 and 3 respectively. The desks in the office are so placed as to keep as little light as possible from entering the store-room adjacent to it, and for this purpose a flat desk is used in the center of the room, while the manager's roll-top desk and one more desk of this kind are placed against the wall and the

partition near the elevator, respectively. As Fig. 2 shows, the entire front of the room is of glass windows reaching from about 2 feet above the ground to the ceiling and permitting plenty of light to enter, especially since the buildings on either side of the street are not high enough to keep the light away from these windows. A coiled-pipe radiator runs along almost the entire length of the window, providing enough heat in winter time. No space is wasted in the office, and only as many files are kept there as are necessary. Likewise, two waste baskets are all that are provided, and, besides the chairs for the force, a small safe is all that remains to be mentioned of the equipment of this room.

A swinging door leads from the hall space into the office and another door of the same type thence to the storeroom. This place has a perfectly workman-like appearance, and resembles an office in no respect except that a small roll-top desk for the foreman is located next to the partition separating office and storeroom. The rest of the arrangement used in this room is

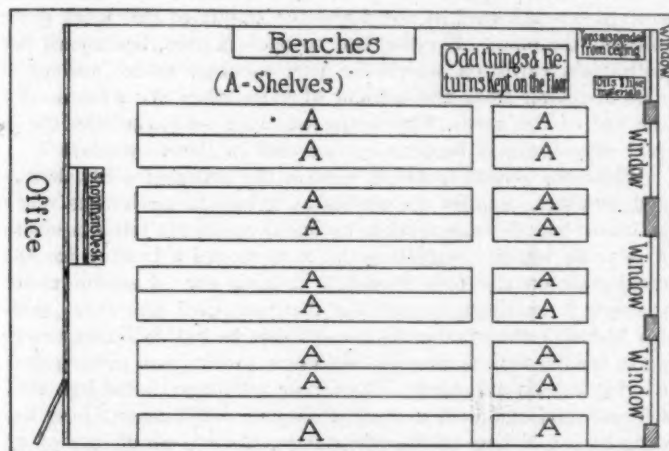


Fig. 3—Floor plan of the room in which the repair parts for all models are kept, showing the advantageous arrangement of shelves for storing the parts

shown in Fig. 3, indicating the position of shelves and working benches, as well as the places where large parts are kept. There are practically seven rows of shelves, each 13 feet high. The total length of each shelf series is about 65 feet, while the depth of the shelves varies. The compartments nearest to the ground have a depth of 34 inches, while the following higher rows are 28, 22 and 16 inches deep, respectively. This latter figure is the minimum depth; that is, upward from about 6 feet above the ground every compartment extends that distance in from the front. The variation in depth is noted on the diagram of a number of shelves illustrated in proportion to their actual size in Fig. 1. Here is also seen the idea embodied throughout the stockroom in regard to the arrangement of parts. The large units of the automobile, such as assembled motors, transmissions, differentials, radiators, and so forth, are kept in the bottom row of shelves, while the parts making up these units are stored in the compartments above. Fig. 1 shows clearly how this idea is carried out. Above the assembled-radiator compartment fans and pumps are stored, which are followed by filters, filler caps, fan blades, strainers, pump casings, fan belts, bolts and nuts for the cooling system, etc. The leading motive in this arrangement is weight, and, to a secondary extent, importance of the parts.

Each compartment or bin is numbered, and the numbers run from one end of the row to the other, and back in the next row above. The numbers of the assembled units bear no relation to the numbers of the parts stored above them, but the only relation there is is contained in the relative position of the bins. Passing from the office end of the row next to the working benches, cooling systems fill up about one-third the length of this row. Every bottom bin contains a radiator, and the various parts of the systems are stored in the upper bins.

The rest of the first row, before reaching the aisle seen in Fig. 3 is devoted to carburetion and ignition. With carbureters arranged in the two bottom rows of compartments, and all such parts as go to complete the gasoline-air mixing and transporting system, as butterflies, inlets and outlets, piping, draincocks, throttle levers and rods, about half of the shelf row is filled. The remaining portion of the first row is used for storing magnetos and various ignition sundries, including wiring, batteries, terminals, sparkplugs and so on.

Passing through the aisle and coming back along the row of shelves backing the first, the storage place for wheels and their parts is next to the aisle, while springs take up the next section of the row, with leaves, bolts and other suspension parts located in the higher-up compartments. The steering system fills practically the rest of the row. Completely assembled steering gears fill up a number of ground bins, and above them a place is provided for steering posts, sectors, steering knuckles, drop arms, bolts and all the other members of the system which makes up the brain of the automobile. Body parts are filling whatever space is left of this row, and this class of material is continued in the next row, where reserve seats, leather hoodstraps, doors and door-locks occupy advantageous positions. The bottom bins of this row are mostly filled up with tire siderings, while on top of the shelves mudguards are located. Front wheel parts are next in the arrangement, hubs and wheels being stored in the lower bins, with bearings stored above them and the top compartments filled with such smaller accessories as front wheel bearings, oil-cups, balls, races, hub-caps, etc.

Transmissions hold forth in the next row. Complete gear-sets, assembled in their boxes, are stored in the two rows next to the ground, all of them being neatly arranged and placed beside one another, so that no difficulty nor loss of time is encountered when one of them has to be taken out of the store. Transmission housings and shafts are found directly above the com-

[illegible]

Fig. 4—Sample of an inventory card such as is attached to each bin. If entries on this card are made conscientiously, it will prove very efficient.

plete sets, being followed, as the eye strays upward, by gear-wheels and bearings on which the transmission shafts run, not forgetting nuts and bolts holding the working members together.

An inspection of the following row reveals the arrangement that has been evolved to store crankcases and other heavy portions of the car to the best advantage. Crankcases take up so much space that some of them are kept in front of the shelves, while several ground compartments are filled with them. Brake systems, consisting of brakes, brake drums, bands, rods, pedals and levers, brake lining and smaller parts occupy the remaining length of the row.

In the sixth and seventh rows rear axle assemblies and elements are stored. Complete assemblies are, of course, kept in the bottom bins, as are rear axle sections, drive and jack shafts, while differential gears and housings, bearings, bevels and pinions, torsion tubes and extensions are stored above the heavy parts, and to fill some spaces in this division muffler parts and fender brackets have also been located here.

Across the aisle, beginning with the seventh row, engine cylinders are stored in the lower bins, while mufflers and muffler parts are kept above them. Accessories of a varied nature, such as sponges and chamois, have not been forgotten. In the following rows oilers, pumps, muffler shells, tire brackets and flexible tubing are found, whereas complete mufflers are kept on top of the shelves. Windshields and their parts are stationed on the floor adjacent to the windows, and this holds good also for a number of axles and shafts which are not so dimensioned that they can be stored in bins. Again the small components of the units mentioned are stored in the spaces above them. The rest of the short rows contain engine parts, crankshafts, camshafts, tappet rods and valves, clutches, starting cranks and straps, water jackets, connecting rods and other members of the power plant. Tire rings are stored in some of the bottom bins, with tire cases next to them, and such parts as brackets, both for tires and lamps, in the higher bins. Side levers and parts follow, and then comes a supply of inner tubes. Care has been taken to keep all rubber goods in a position well protected from the light. Whatever space is left is occupied by thrust bearings, foot levers and pedals, acetylene generators, cardan shafts, universal joints and elements of the latter.

Between the shelves and the wall, next to which the benches are placed, various material is stored. Many of these things are faulty parts returned and replaced under the guarantee, and others special equipment not included in standard cars. Oils, tire healing compounds and similar things are kept on a narrow shelf near the window, and facing them tops are suspended from the ceiling, one close to the other, avoiding all waste of space.

Beside the material kept in this storeroom there is a number of rear axle assemblies for which there is no room in this department. They are kept in a place two floors below the stockroom, where also a number of chassis are stored. But the bulk of the repair parts, in fact, everything that may be needed every day in the year, is kept in the regular stores on the fifth floor.

The special and live inventory system of the Mitchell company has yet to be described. It consists of cards, Fig. 4, one of which is hung on a nail above each bin, and on which the quality and quantity of the bin's content is noted. Fig. 5 is an actual reproduction of a card used on compartment No. 69, in which waterwheels for the circulating pump are stored. When stock was taken on October 20, the day after the company had moved to the new building, eighteen waterwheels composed the stock. This state of things, however, was changed when eight days later a waterwheel was taken out of the stock, to be used on sales order No. 17,823. This sale was not done on a new car, but it was really an order for the repair part sent in by an out-of-town Mitchell agent, who required the part for one of his customers. The so-called sales order generally does not contain the name or description of the part, but only the part number, which in this case is J-51. The mark R. T. S. 1909 refers to the model and year of the machine for which the waterwheels kept in this compartment were designed.

On October 30 another waterwheel was taken out of stock, reducing the number of wheels to sixteen. Meanwhile an order has been sent to the factory and Racine, Wis., to send a fresh supply of four waterwheels, which arrived on November 6, as may be seen by referring to Fig. 4. Within one week three wheels were again ordered by sales agents, but then a new shipment arrived, which increased the number of parts in stock to twenty-five. On the following two days one pump each was taken from stock, these times to be used on a repair order done on the premises.

Referring to the spaces on the card not filled out in the illustration, their purposes are as follows: Under the heading On Order the number of reserve parts ordered from the factory are entered the day when the order is sent there, and the number of the order sent to the factory is also noted. The reason for these spaces not being filled out on this card is that the parts which afterward came in were ordered before the company moved to its new quarters, and there started a new inventory.

Several times a year the number of parts in stock, which is entered on each card, is noted and the results of this work compiled by the office. For this end no book is used, but a card file with plain cards on which the part number, model and year, date of taking stock and amount of parts taken are written. By the use of the cards, Fig. 4, the work of correcting the file is very easy and may be done by two men in about two days.

While the inventory file is kept in the order of parts, letters and numbers, another file serves as a key to an initiate when he has to look for a part while no one is around to tell him where it is to be found. Supposing the man needed a bearing for the crankshaft on the 1911 Model T touring car. Looking under crankshaft bearings he consults the 1911 card and there finds for Model T the number 2,357. All that he has to do now is to go to the bin thus numbered, take out a bearing and make a note of the fact on the card. The whole operation takes less than five minutes, and with a man of average intelligence, if he has once been told how to use the system, there is no chance of an error in his handling it.

The total number of bins in the Mitchell stockroom is 2,853, and despite this large number the simple and yet elaborate system makes mistakes very improbable. There are 8,136,756 chances of making a mistake by misplacing parts in the storeroom containing 2,853 bins, but it is only due to a poor system or poor workers executing it if any of these mistakes happen. Naturally, when mistakes start in and increase, things must in course of time reach a state where the system is not worth anything. But in this case the remedy would lie only in the getting of the proper men capable of executing it and willing to do so. It must be remembered that even where a good system is introduced the personal equation plays its part, since it takes persons to handle the system; but since this is the case, failure, if it occurs, must be charged up to the factors that bring in the personal equation, and not to those which tend to do away with it.

BLUSHES DEEPLY WHEN TOO HOT.—A paint that sticks well to metals, or to most of them, and changes from a pink to scarlet, then to maroon and finally to black, as the temperature of the metal rises from ordinary to 50 deg. centigrade, to 70 deg. and to 85 deg., and which goes back to its original pink when the metal cools, is among the recent inventions of German chemists. It is offered under the name of "Efkalia," by Franz Korn, in Halle an Saale-Trotha. It may be applied on top of other paint and seems to promise a wide utility as a warning signal and heat indicator for spark plugs, cylinder heads and anything in factories which may run hotter than it should. It is stated that several fire insurance companies have taken it up. In suitable applications, it may evidently be used for experimental work, as for a ready determination of the operating conditions under which an automobile motor wastes or does not waste the calories with which it works, or for determining the efficiency of radiators or other cooling provisions.—From *Metall-Technik*, Oct. 28.

Peeps Thro' Goggles at Distant Lands

NOTWITHSTANDING the rapid increase in automobiling in India, a most disturbing inconvenience lies in the difficulty which owners experience in obtaining spare parts from Continental European manufacturers. In some instances it has been necessary to wait three months for the arrival of parts. It is suggested that the waiting-time might be cut down materially by the registration of one's motor car and the coining of a mutually understood code between the manufacturer and buyer at the time of purchase, that needed parts might be cabled for.

Glasgow has just gone on record as having accomplished two acts of public service. The authorities have dispensed with every horse in the fire department except two, the horse-drawn engines having been replaced by motor-pumps; while the old horse-drawn prison van has given way to a modern motor-van, which is doing regular corporation service.

Following close in Glasgow's footsteps come Leeds, Manchester, Birmingham, Liverpool, Belfast, Dublin and London. In the first named six cities changes are being pushed gradually, motor-pumps crowding out the horse-drawn engines. In London the march of modern ideas is swifter. It was only at the last meeting of the London County Council that an appropriation was made and tenders called for to supply the fire department with thirteen motor-pumps. City authorities declare that within ten years there will not be a horse-drawn fire engine in any of the large cities of England, Ireland or Scotland.

Herr Von Dallwitz, Prussian Minister of the Interior, has just issued a decree declaring the blowing of motor-car horns as unnecessary, either by day or night, and accordingly he regards the making of such noises as a breach of the peace and as a misdemeanor, and he will see to it that offenders meet with punishment fitting the alleged crime.

A German has taken out a patent for warming the rugs or carpets on the floor of the automobile. The contrivance involves a series of wires which run through the carpet and the current being turned on, the result is a sufficient amount of heat to keep the passengers' feet comfortable in the winter.

A short Bill for amending the Motor-Car Act has been introduced into Parliament, which will relieve drivers of automobiles of the necessity of taking out duplicate licenses. Men are obliged, under the present system, to take out a police-driving license, in addition to the ordinary license from the City Council, a fee being exacted in both cases.

The British Government is still extending the use of the motor-car for the conveyance of mails. Over one hundred services or sets of services are now being performed, by motor-car vans. During the year important services of this kind have been established between London and Portsmouth, London and Birmingham, Glasgow and Greenock, Dublin and Kells, etc. The motor-vans have replaced horse-vans in a number of services in London. The postal authorities admit that the greater speed of motor as compared with horse traction is of considerable advantage to the mail service.

During the year just ended, 800,000 gallons of tar were used on the county roads of Kent, England. The cost was over \$100,000. In addition, ninety-one tons of bituminous binding preparation was used, its base being asphalt. The result is that Kent has good roads.

France proposes to run a motor-car reliability trial over a distance of 5,000 kilometers during the early part of the year 1912, the cars to be divided into two classes. Light automobiles to include all machines, of which the price of chassis without tires shall not exceed \$1,600; and voiturettes, complete, the price

not to exceed \$800. It will be stipulated that competing cars shall be equipped with two-seated bodies, wings, steps, lamps, headlights and wind-shields. Not more than three machines may be entered by any one manufacturer. Repairs during the luncheon hour will be debarred. The regulation average speed for the light cars will be thirty kilometers per hour; and twenty-five kilometers is set for the pace of the voiturettes. The fees for entry are 500 francs for one car; 900 francs for two cars, and 1,200 francs for three cars entered by the same manufacturer; 250 francs for one voiturette; 450 francs for two voiturettes, and 600 francs for three voiturettes entered by the same manufacturer. The route, starting at Paris, is to comprise Besançon, Lyons, Grenoble, Nice, Marseilles, Montpellier, Toulouse, Bordeaux, Nantes, Le Mans, Rouen, Lille, Rheims, and return to Paris.

The London fire brigade has at last dispensed with solid tires used on rickshaws or tenders, substituting pneumatic tires in their place.

A recent experiment in road-paving near Birmingham, England, has proven a success in many ways. It is called the new "leather pavement." The base of the composition is waste shreaded leather, reduced almost to a pulp. This is whipped into a batter with tar and bitumen, after which it is spread on a concrete road-bed. After it has become dry this new "leather pavement" settles down as hard as a rock and affords a smooth, cushion-like surface. The heaviest of motor-car wheels make no impression on it. Dust does not result from the traffic, nor does the road get greasy. It is weather-proof, noiseless, and a boon to the foot of the horse, as well as to the tire of the motor-car. Its cost has not been determined; but, should it not prove too expensive, it may make a great improvement in modern methods of road-building.

The County Council of Warwickshire, England, has passed a by-law making it obligatory for the occupant or driver of every vehicle, no matter of what type, bicycle, cart, carriage or motor-car, to attach a red light on the rear of the vehicle while passing through or traveling in the county.

The latest invention in the way of covering for automobile footboards is a matting made in picturesque designs from aluminum. One cannot slip on it and its metallic composition makes it easy to clean. It is also almost indestructible.

The automobile will soon be running over a section of the Congo territory which echoes its tales of barbarous deeds of mutilation in connection with the harvesting of rubber by natives. Already the motor-trolley has leapt out across portions of the land, the line threading dense forests. Preparations are on foot for the making of roads for automobiling, the contemplated scheme being to link up Broken Hill, Bwana Mkubwa and Luembe.

Odd as it may seem, motor-bus and tram-car drivers of gay Paris have been up to the present time allowed to smoke while driving their respective vehicles through the streets of the French capital. But the custom developed into such a nuisance that the public raised its voice in protest; in consequence of which the companies have issued orders to the men forbidding them to smoke during the hours they are on duty.

The Royal Swedish Automobile Club has revised the rules which governed the Gothenburg-to-Stockholm motor-car trial last winter, under which 48 and 60 hours respectively was the maximum time for the two classes. Under the new rules the minimum speed allowed will be 10 and 9 kilometers respectively per hour. Should the course exceed 600 kilometers the permissible speed will not include compulsory stops.

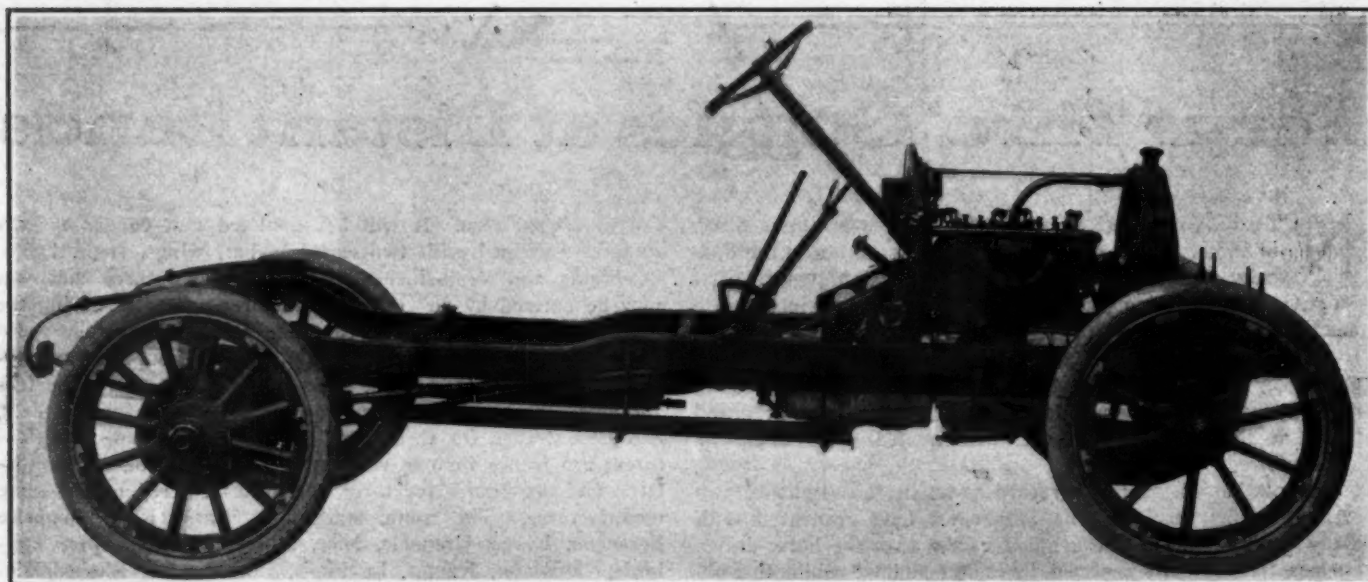


Fig. 1—View of chassis of the Bergdoll 30 for 1912, showing double drop construction

Bergdoll Adds a Forty to Its Line

RADICAL departures from the usual practice have not been made by the Louis J. Bergdoll Motor Company, of Philadelphia, Pa., in bringing out its line of cars for the season of 1912. The company is continuing to build the Bergdoll 30, which first characterized its line last year, but in addition to that a new and larger car has been added. This car is equipped with a motor claimed by the makers to develop slightly in excess of 40 horsepower.

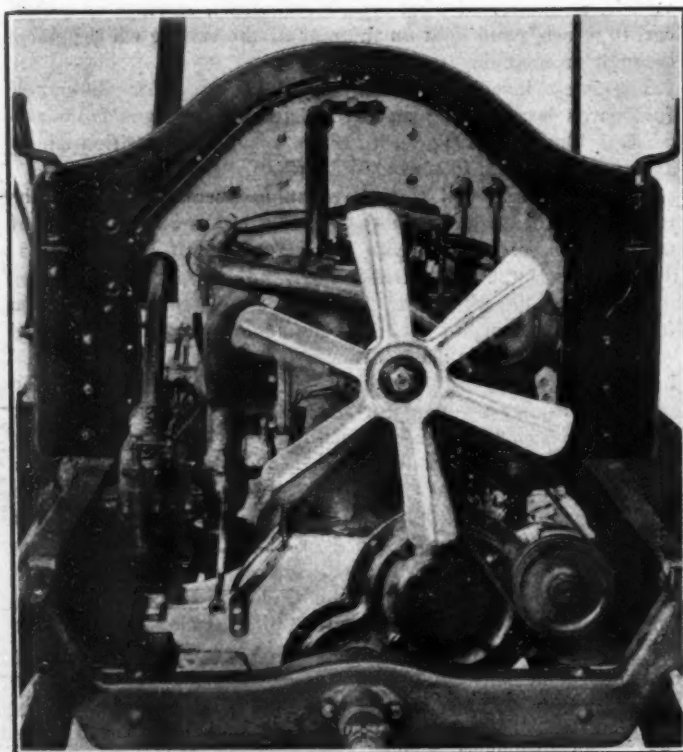
The motor of the latter has a bore of 4 inches and a stroke of 6 inches, giving a stroke-bore ratio of 1.5, and has four cylinders

which are cast en bloc. The exhaust valves are located on the side of the cylinders and are placed just below the removable caps, so that they are readily accessible in case it becomes necessary to withdraw them. The water jackets are cast integrally with the cylinders and extend around the valve ports, thus adequately cooling these parts. The inlet valve opens downward into the head of the cylinder, while the exhaust valve opens upward. The inlet valve cage is readily removable so that this part is also easy to reach should it become necessary to remove the valve for purposes of inspection or repair. A noteworthy feature of the valves is that the inlet valve is provided with a flat seat while the exhaust valve seat is of the 45-degree type. In case it is desired to fit a duplicate set of spark plugs there is an aperture in the top of the cylinder sealed by a plug.

The flat head pistons on the new motor are 5 inches in length and are fitted with four piston rings located above the wristpin and ground to fit. The material of the piston is of selected gray iron, ground to a finish and balanced in connection with the other reciprocating parts of the engine. The wristpins are of hardened steel and are hollow in section. They are $1\frac{1}{4}$ inch in diameter and the thickness of the metal is $\frac{3}{8}$ inch. The upper ends of the connecting-rods are fastened to the wristpins by means of clamp bolts held by the bolts which pass through them. The connecting-rods are 12 inches in length and are drop forgings of selected steel. They are of I-beam section and at the lower ends are broadened to secure a bearing surface of good length on the crankpin.

The crankshaft is carried upon three main bearings of annular ball type, the rear end connecting to the flywheel member of the clutch, while at the forward end the shaft terminates in a gear which drives the half-time wheels. The crankshaft is of carbon steel drop forged and ground to fit. The crankpins are 2.1-8 inches in diameter and the connecting rods are bushed with die-cast metal to form a bearing surface for them. The connecting-rod bearing caps are of adequate size to guard against breakage at this important point.

The camshaft is readily accessible beneath a cover plate in the side of the crankcase. When this plate is removed the whole valve mechanism may be inspected and the camshaft bearing cages removed. The cams are an integral part of the camshaft



Front view of motor and dash of Bergdoll 30

and act directly upon the tappet rods and not through fingers. The camshaft is carried upon three annular ball bearings which are of large size in order to reduce wear on these parts; it is driven through a set of gears at the front end of the motor. These gears are encased in a housing, the cover of which is made removable by taking out the stud bolts which hold it in place. The last wheel in the train is used to drive the water pump and magneto shaft, while the middle wheel drives the camshaft. An Oldham coupling is inserted in the latter shaft, which is an exterior fitting, so that it may be readily taken down when such an act is necessary. The valve action is readily adjustable by means of the two nuts which may be seen in Figs. 2 and 4. The wear on the tappet rods is taken up by merely turning these so that the lost motion disappears. The valve springs are also exterior fittings and are thus readily accessible.

The crankcase is an aluminum casting and is extended back in order to make a housing for the flywheel. The motor supports are four in number and are cast integrally with the crankcase, the rear two being on either side of the clutch housing. A shelf is cast on the side of the crankcase to support the magneto. The crankcase is in two parts, the lower being a factor in the oiling system, which will be described later. The upper part forms a basis of support of the cylinder casting as well as of the bridges which carry the bearings of the crankshaft and camshaft.

The motor is lubricated by the splash system. The crankcase is divided into four splash troughs into which the connecting-rods dip. Besides being divided laterally to form the splash chamber the crankcase is also divided horizontally in such a way that the casting has a double bottom. The upper bottom is molded in such a way as to form the splash troughs just described. Below the troughs in what may be called the lower bottom of the crankcase the oil is carried in a plain basin-shaped reservoir.

The reservoir in the bottom of the aluminum crankcase casting is filled through the breather pipe. In filling, the cover of the breather is removed, disclosing the filler opening equipped

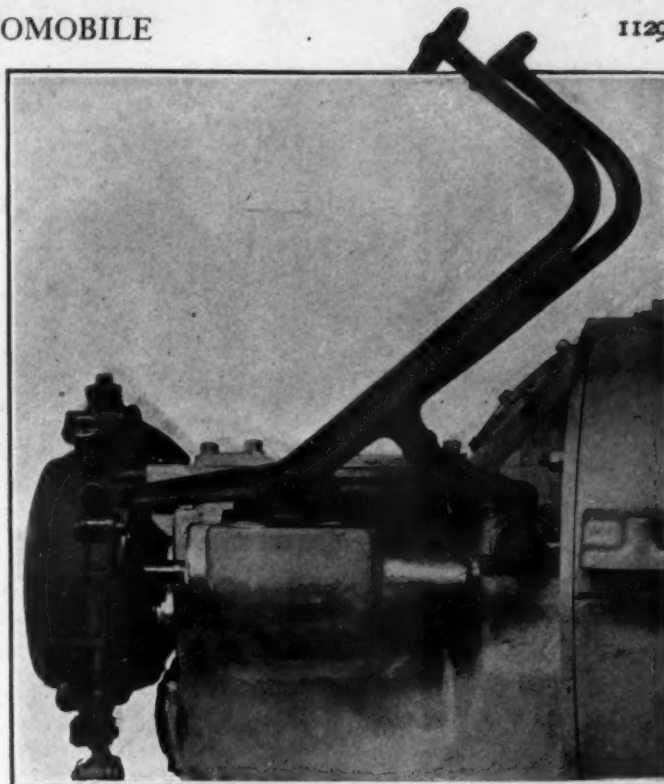


Fig. 3—Showing the unit housing of the clutch and control pedals

with a strainer. The upper test-cock on the side of the crankcase is left open while filling and oil is poured into the filler hole until it starts to flow from the cock. The cock is then closed tightly. The lower test-cock is for the purpose of draining the reservoir, the oil never being allowed to become so low that there will not be a flow from this cock. The breather pipe is located on the exhaust side of the motor, just behind the magneto shaft. The oil is drawn from the reservoir by a pump which

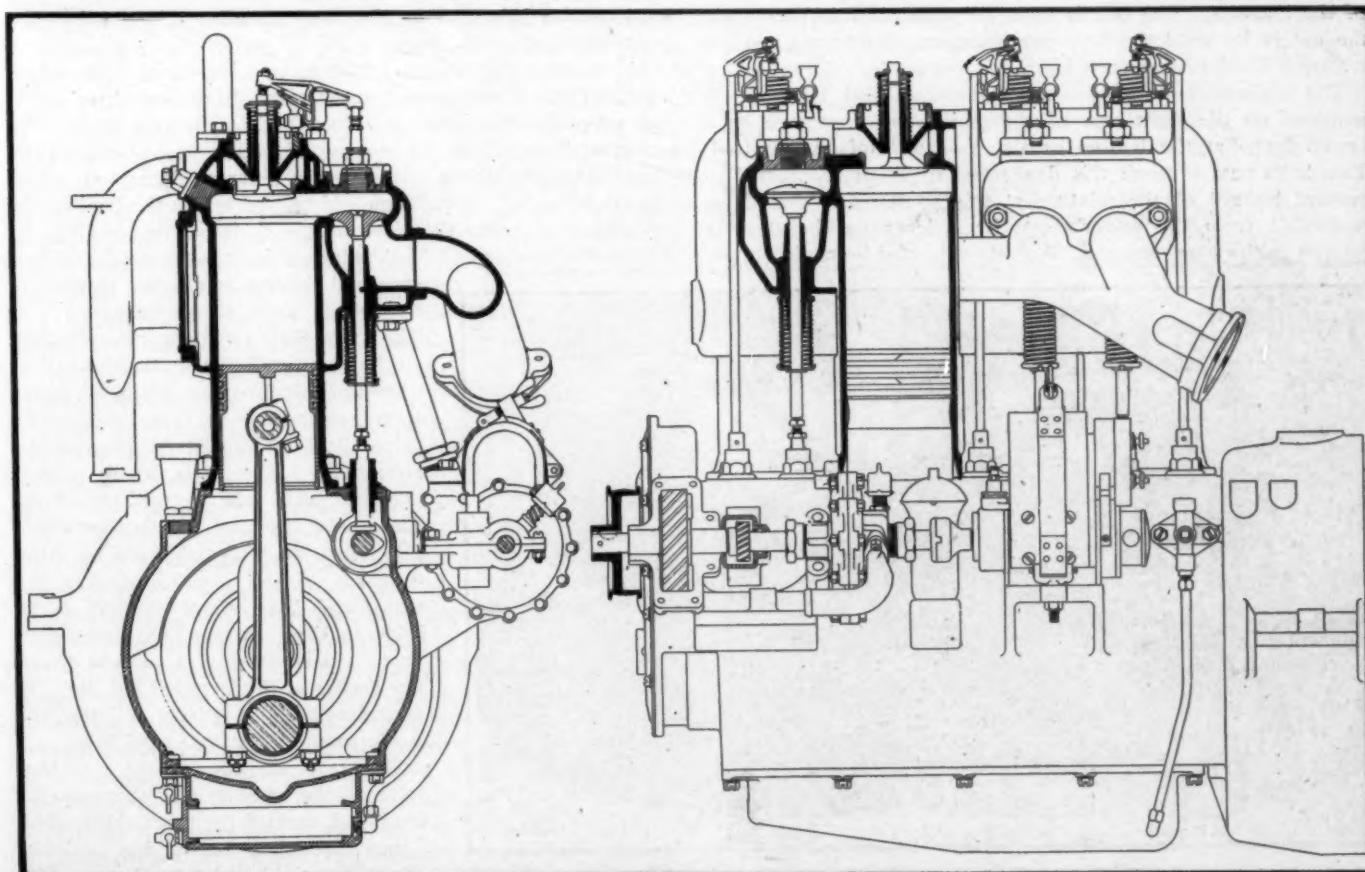


Fig. 4—Transverse section and part longitudinal section through the Bergdoll motor



Fig. 5—Illustrating the Bergdoll torpedo touring car

takes the oil from a suction pipe leading to the pump from the rear end of the exhaust side of the motor. The oil is then forced up through a vertical lead into the sight-feed located on the dash. Thence the oil flows down onto the opposite side of the motor and is led into the crankcase at the forward end. The oil from this lead will fill the front splash trough and then overflow into the second and from there to the third and so on to the rear. After reaching the correct level in the rear splash trough the oil overflows back into the reservoir through an overflow in the rear of the crankcase.

Ignition is effected by a Bosch magneto known as the easy-starting type. With this magneto no batteries are required, and hence none are fitted on the Bergdoll cars. The magneto is readily dismounted from its position on the side of the crankcase by unscrewing the bolt which holds the clip over the top of the magnets. The bolt is mounted on a joint so that when the nut is loosened the bolt may be swung downward and the magneto lifted from its shelf.

The carbureter is of the automatic float-feed type. It is mounted on the right side of the motor and supported by a broad flange at the bottom of the Y-shaped intake manifold. Two bolts pass through this flange and a gasket is inserted to prevent leakage of the mixture at this point. The throttle is controlled from the driver's seat by a lever on the steering column in the usual manner. Adjustments may be made on the

carbureter by means of knurled screws which are fitted in an exterior position and govern the gasoline, air and automatic air intake. In order that the mixture be kept constant at all times the carbureter is hot-water-jacketed, the supply being drawn from the lower part of the water-jacketing of the cylinders on the right side.

The clutch is of the multiple disk type faced with asbestos fabric known as thermoid. It is encased in an aluminum housing which is a continuation of the crankcase as explained above. The rear part of the housing is formed by the casing of the gearset, which is so shaped that it fits against the rear of the flywheel casing and is held thereto by means of bolts. An inspection cover is fitted in the clutch housing, through which any necessary adjustments may be made, as it is large enough to permit the hand to easily pass into the interior

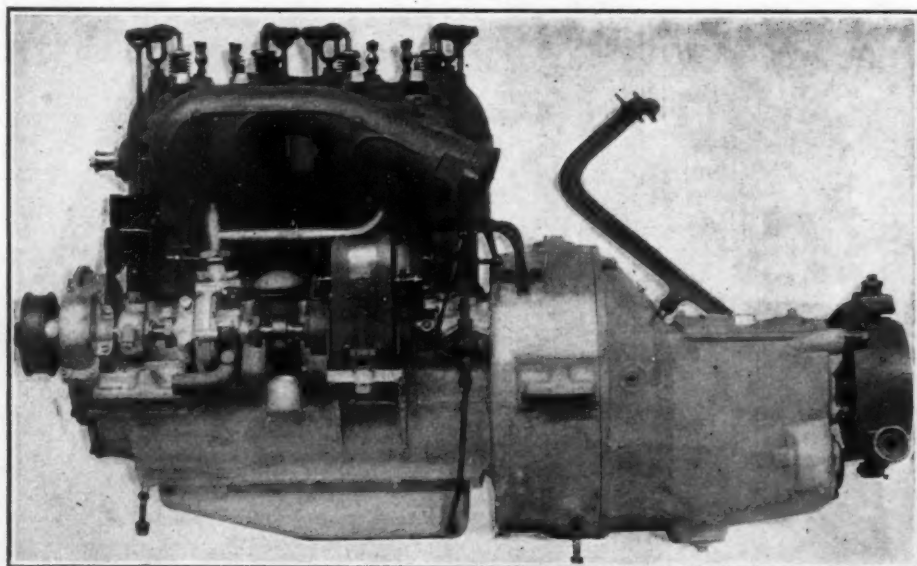
and manipulate any of the parts requiring regulation. The necessity for adjustments on this type of clutch, however, is negligible, being for the most part due to carelessness. The majority will be found to be cases where the operator of the car has neglected to give the clutch the ordinary care.

The drive is taken up from the clutch through a gearset of four forward speeds and one reverse. The drive and gear change shaft are of chrome vanadium steel, while the gears are all of nickel steel, a combination which should give great durability and strength against sudden stresses. The bearings which support the shafts are of the ball type and so designed as to withstand end thrusts when changes in speed are made and when the clutch is engaged and disengaged. The gearset is rendered readily accessible by raising the floor boards of the car, disclosing a flat cover plate which fits over the gearset. There are four bolts holding this plate in place and a gasket is inserted in the joint to make it oil-tight.

At the rear of the gearset there is a universal joint which separates the change-speed mechanism from the drive shaft through which the power is transmitted to the rear axle. This universal joint is for the purpose of taking up any changes in alignment which occur owing to the different degrees to which the car is loaded. A difference of one person in the load of the tonneau will change the slope of the shaft and hence alter the direction of the drive.

This universal joint takes up this difference and renders it possible to operate the vehicle under all conditions of load. The drive shaft is of chrome vanadium steel and is fitted at the rear end with a universal joint through which the power is transmitted to the rear axle. The drive shaft is relieved of all torsional strains by torque rods which connect the rear axle and the chassis frame. The strains encountered when making a sharp turn are thus taken up by other members of the mechanism than the motor and drive, and hence will do no harm to these parts. The torque rods may be seen in Fig. 1, which depicts the chassis of the Bergdoll No. 30. The arrangement of the drive and the rods is the same on the two models.

The rear member of the universal joint on the after end of the propeller shaft is a part of the short shaft which passes through a stuffing box and into the differential housing on the rear axle.



A complete view of the motor, showing the unit power plant

At the rear of this short shaft, and also an integral part of the same, the bevel pinion which operates the large bevel wheel of the train of differential gears is found. Just within the stuffing box through which the short shaft passes there is a seating which holds an annular ball bearing. This in turn supports the shaft. Another ball bearing is located just forward of the star pinion and supports the rear end of this shaft as well as acting as a bearing for the star pinion. The large differential wheel is also carried upon ball bearings of annular type, and drives the differential wheels which in turn actuate the live axle shafts.

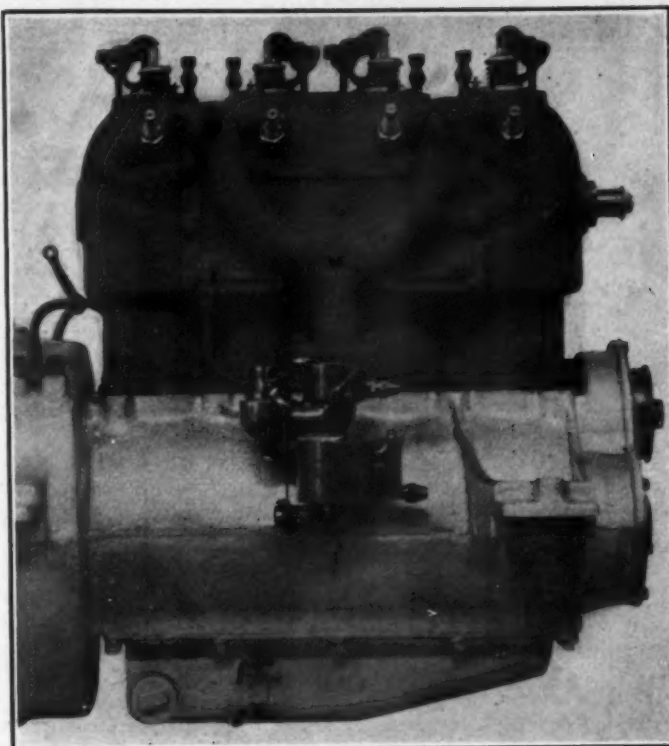
The rear axle is of the floating type, the housing being of pressed steel. The live members are all carried upon annular ball bearings and the material of which they are made is heat-treated nickel steel. The ends of the axle shafts are squared so that they may be readily withdrawn by simply removing the hub caps. When these are removed the ends of the shafts are disclosed and there is nothing else required but to simply draw them out. There is a flange on the end of the shaft to which the wheels are bolted. Six bolts form the means of connection between the wheels and the corresponding holding flange.

The brake drums are a part of the rear wheels. There are two complete and independent sets of brakes for service and emergency purposes. The service brakes are controlled by a pedal and are fitted with equalizers so that the pressure exerted on the drums on both sides of the vehicle is the same. These brakes are of the external type, consisting of bands which contract about the drums on the application of pressure on the pedal. The bands are faced with thermoid, while the drums upon which they act are of steel. The drums are 14 inches in diameter and $2\frac{1}{2}$ inches in width, giving ample surface to bring the car to rest smoothly and rapidly. The emergency brakes, which are controlled by a lever, are of the internal expanding type. Upon application two internal bands are spread apart, turning about a pivot and bearing against the interior of the drum. The power is equalized on these two brakes in the same manner as in the other brakes; that is, through equalizing rods.

The wheels are of the Schwartz artillery type, the wood used in their construction being of second-growth hickory. The rear wheels are of slightly heavier construction than the forward pair, having twelve spokes while the forward wheels have but ten. The wheels are 36 inches in diameter all around.

A glance at the chassis of the 30, which is shown in Fig. 1, will give a general idea of the frame construction. The side members of the frame are of channel section and of dropped construction, being raised up over the rear axle. The material used throughout the frame is pressed steel and the various members and sub-members are hot riveted to each other. Two flanged triangular gusset plates are riveted to the side chambers and to the dash structure so that great stiffness in this part of the frame is attained. The motor is supported by a sub-frame of deep construction which is riveted to the main members of the frame.

The front axle is a single drop forging of selected steel and is fitted with large size annular ball bearings for carrying the front wheels. The steering gear is of the worm and gear type, and is controlled by an 18-inch hand wheel mounted on a five-armed aluminum spider. The spark and throttle control levers and quadrants are mounted upon the handwheel in the usual manner. The control is on the left side of the car throughout, and in the case of the fore-door models the levers are contained within the body. A self-starter of the Ever-Ready type is included on



Inlet side of the motor, showing carburetor and intake manifold

the 40 if so specified by the customer, without extra charge. The starter is designed to be of use in starting the motor at any time, whether it be stalled or in starting for the run. It is guaranteed to start the same by a simple pressure on a pedal or lever which releases the brakes holding the mechanism and automatically cranks the motor.

The chassis is supported in the front upon semi-elliptic springs having a span of 39 inches and a width of 2 inches. The rear springs are 45 inches long and 2 inches wide, being $\frac{3}{4}$ -elliptic in shape. The spring shackles are fitted with integral grease cups while the lubrication of the springs themselves may be accomplished by jacking up the car and applying the lubricant after the weight has been lifted from the spring.

This, however, will not have to be done very often as it comes in the category of overhauling. The springs are so shaped that the lubricant will be held in place for a considerable length of time without replacing.

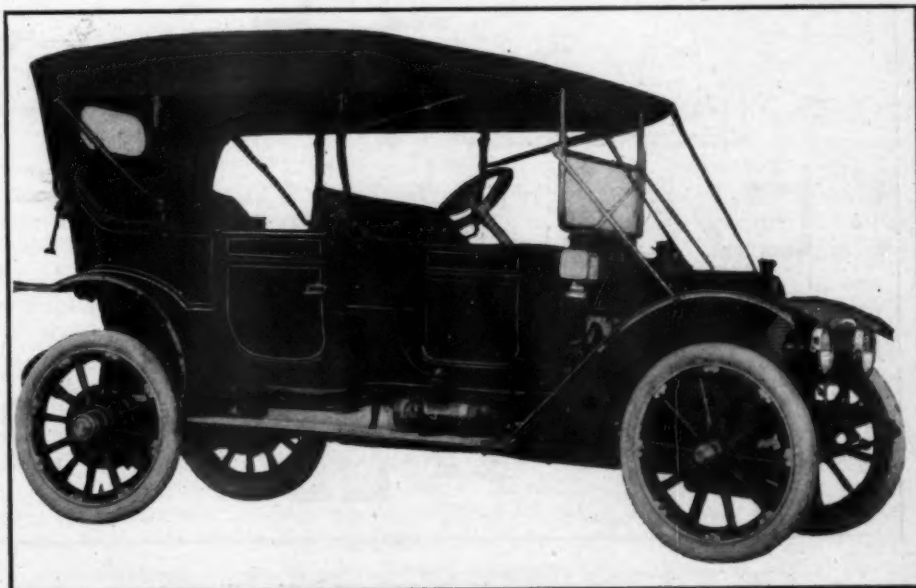


Fig. 8—A view of the model C touring car of 1912 type

Fluid Pressure Speed-Changing

CONSIDERABLE danger to transmission gears is involved in the possibility of changing and consequently stripping the gears while in mesh. On the other hand, even if speed-changing is done in the correct manner, with the clutch disengaged and the gears at momentary rest, the work of shifting the gears is not such an easy one as might be desired. These two setbacks of transmission gears are claimed to have been overcome in the construction of a speed-changing device by Allen M. Irish, of Bath, Me. The device consists principally in a balanced plug-cock which serves to regulate the flow of gas under pressure to the mechanism's working clutch and transmission gearset.

The general arrangement of the device installed is seen in Fig. 1, where P is the cylinder of the engine, or, still better, that of a mechanically operated air pump, charging air through check valve V into storage tank S, where it is compressed to the proper degree. A tube leads from S to the distributing valve V₁, which is regulated through a shaft and gear attached at the top of the steering post right beneath the wheel. Fig. 2 is explanatory of the construction of the valve V₁, Fig. 1, which was first referred to as a balanced plug-cock. Valve plug P, Fig. 2, is fitted into the valve body B, with passageways bored in it, permitting of the passage of a gas from inlet I to port T or higher up around the valve spindle S to the cylindrical space S₂. This space is sealed upwardly by means of the valve V₁ which is held against the seat by spring S₁. Tightness of the valve V₁ against its seat is insured through gasket G. The rod R serves to depress V₁ at the will of the operator, in which case the passage of the gas is continued the clutch supply port C₁. C C are clutch exhaust ports, the function of which will be explained later on. The rod R is operated by operating lever O fulcrumed to it at F and pivoted at P₁.

If the valve is in the position Fig. 2, the flow of the gases from the storage tank is illustrated by the horizontal section through the plane of T. Port T here registers with lead T₂ through which the gas is directed to the gear-shifting mechanism G₁, Fig. 1. When T and T₂ registers as here illustrated, the operating lever O rests in a notch N₁, Fig. 4, so that the valve plug is held in its position.

Lifting the operating lever as seen in Fig. 5 permits of rotating it until it comes to rest in notch N, Fig. 4. While the lever is out of engagement with either notch, T bears against the valve body B and valve V₁ is depressed off its seat, and the gas entering at I and passing in part by the port T₂ flows up around the spindle, leading through the clutch supply port C₁ to the clutch-operating cylinder, Fig. 6. The cylinder C is supported by frame F and closed at its other end by the cylinder cap C₁. Plunger P is adapted to rotate in the cylinder, the piston rod is resting in the plunger hollow H, while the spring S serves to hold piston rod and plunger in constant engagement. Gaskets G and G₁ are provided as a double insurance against any gas leaking from the space containing the spring past the piston and out of the upper end of the cylinder. The gas coming from the distributing valve enters the mechanism at E and drives up the piston and plunger rod. The latter is fulcrumed to the clutch lever C₂ as shown, and this lever being pivoted at a place some distance from the fulcrum disengages the clutch. In lifting the rod R the action of a spring holding C₂ to the engaged position must be overcome, and as soon as the pressure driving up the piston P ceases to act, the piston returns to the position indicated by the dot-and-dash line and the clutch again drops into engagement.

This takes place after the operating lever O has completed its travel from notch N₁ to notch N and has come to rest in the latter. At the same time valve V₁ is lifted back to its seat, Fig.

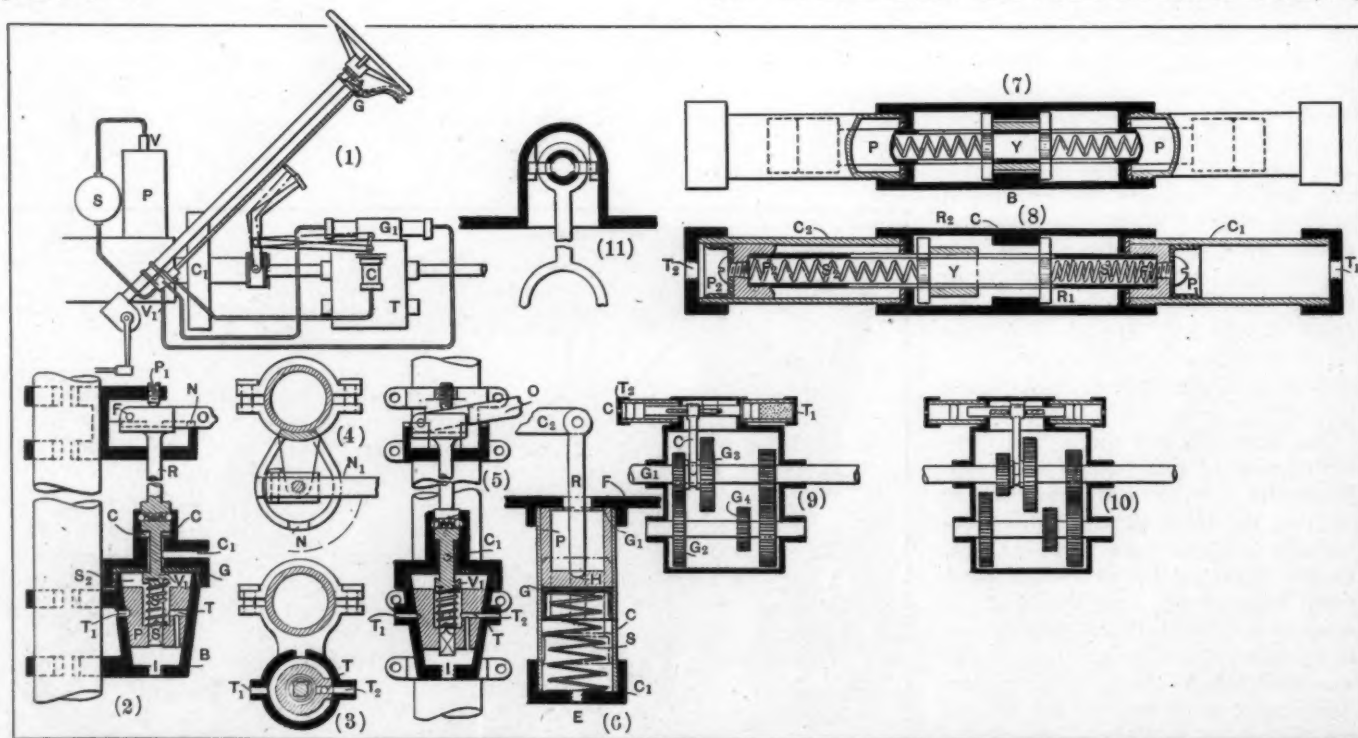


Fig. 1—General arrangement of Irish gear. Fig. 2—Method of attaching distributing valve to steering post. Fig. 3—Section through valve and post. Fig. 4—Operating lever and notches. Fig. 5—Lifting lever for shifting the gears. Fig. 6—Clutch operating mechanism. Fig. 7—Gear operating mechanism when gears are in normal. Fig. 8—Shifting gears by admission of gas through T. Fig. 9—How mechanism operates transmission gears. Fig. 10—Gears in neutral

2, and the gas contained in the gas lead to the clutch-operating mechanism is permitted to escape through C C in the same illustration. When O rests in N, port T registers with T₁, so that the gas entering the valve body at I takes a different path.

The gas flowing through T₂ and T₁ flows to the gear-shifting mechanism, Figs. 7 and 8. The body of this mechanism contains a plunger P P, having attached to its ends pistons P₁ and P₂, which slide in cylinders C₁ and C₂. The middle portion of the plunger carries a yoke Y, while inside the plunger springs are fixed at respective ends F₁ and F₂ of the plunger. Spring retainers R₁ and R₂ by bearings against the portion C of the body limit the travel of the piston to either side, and tightness of all joints is insured by means of gaskets. Gas may be admitted to the spaces adjacent the pistons through ports T₁ and T₂ communicating with the outlets of the distributing valve marked in the same manner. The admission of gas has the effect of putting the spring on the admission side under additional compression, while the other spring remains undisturbed.

The operation of the speed-changing device is seen in Fig. 9. By admitting gas through port T₁ the piston is moved toward port T₂. The yoke is thereby moved in the same direction, bringing gears G₁ and G₂ into engagement. The opposite movement of the plunger and yoke, caused by admitting gas through T₂, would bring G₃ and G₄ into engagement. Gears are in neutral, Fig. 10, when the yoke occupies a central position, which is the case when no gas is admitted from the distributing valve if the port T bears against the wall of the valve body. Fig. 11 is a vertical cross-section through the speed-changing mechanism at the point of the yoke, illustrating the manner in which the latter is fixed to the body of the mechanism by keys sliding in guides.

The illustrations bring out a number of details which were not

specially mentioned in this description, but which will readily be noted by the man interested in this new construction. Apparently there is little or no difficulty involved in this device, and the only point demanding special care on the part of the maker would be tightness against air or gas under pressure, which can be obtained without too much trouble by exact fitting of the parts and sufficient packing of the joints by gaskets. No stuffing-glands are used throughout this apparatus. One of the refinements of the system is a shut-off valve interposed in the line between pressure tank and distributing valve, the shut-off being operated in connection with a lock, the key of which is in the owner's possession. This arrangement makes gear-shifting impossible when the car is left alone, but a positive locking means would be obtained if the operating lever of the device could be locked, by means of a key, when in a position between the two notches, for then it would be absolutely impossible to move the automobile by its own power without the owner's consent.

By the application of the Irish mechanism the clutch pedal on the footboard becomes superfluous, at least so far as this use of it is concerned. But incidentally the elimination of this member would allow the installation of a second brake pedal in its place, for advantageously working the emergency brakes of the car. Such an arrangement would do away with the rather troublesome situation of a motorist becoming unaccustomed to the use of the emergency brake, because this is unhandy as compared to the service brake operated more easily by its pedal. If, however, the emergency brake can be operated by foot, there is no cause for any disinclination on the part of the automobilist to use it when occasion arises. Besides these, there may be other advantages in this construction which its continued application may reveal.

Harking Back a Decade

FROM *The Motor Review*, December 26, 1901:

The H. W. Johns Manufacturing Company, of New York, and the Manville Covering Company, of Milwaukee, have consolidated, the merger to take effect January 1. The name of the new concern will be the H. W. Johns-Manville Company. The company is completing a plant at Milwaukee for the manufacture of carbonate of magnesia and mineral wool.

It is announced that the International Motor Company, capital \$2,000,000, will handle the automobile business of the American Bicycle Company. George Pope has been elected president of the motor concern.

The Equipment Motor Company, capital \$6,500,000, has been incorporated in New Jersey and will handle the motor branch of the International Power Company. The Electric Storage Battery Company has won its suit to sustain the validity of the Brush patent before Judge Cox in the United States court. The suit was brought against the National Battery Company.

Essex County, N. J., has struck a responsive chord in the hearts of automobile owners by raising the restrictions that have been laid against the operation of cars in the public parks within the county. All that the motorist now has to do is register and carry a number in rear and on his lamps; keep within the speed limit of 7 miles an hour; come to a stop if horses appear restive; sound no gong except in crossing a street; be ready to show permit to any guard and in case of failure to observe all these rules the permit will be rescinded permanently. The motorists are delighted.

Under the new French law the chauffeur who has part in any accident and then runs away will be subject to a fine of from 16 to 500 francs and imprisonment for from 6 to 60 days.

Foxhall Keene hired a plumber to make some repairs on one

of his racers last week. The plumber may be out of the hospital in a few days, his eyesight having been saved by the prompt efforts of physicians. Some hot resin blown out of a tube almost killed the man.

Joseph L. Brayton, of Cleveland, touring with his wife last week almost came to grief near Geneva, N. Y. A bull broke through a fence and charged the Brayton car. Mr. Brayton put on all speed and managed to escape although the bull was a good second for quite a distance.

The Bartholomew Company is preparing to enter the automobile business at Peoria. The company has been engaged in making peanut and coffee roasters and recently determined to go into motor car manufacture.

The price of Oldsmobiles will be increased to \$700 on January 1. This will make the second advance in price in 6 months.

The Automobile Club of America is engaged in a plan for affiliating the various American automobile clubs. The A. C. A. proposes to be recognized as the supreme head of automobile sport in America. This phase of the plan has met with some opposition.

Exports for the week, including both cars and parts, amount to more than \$46,000 from the port of New York.

The development of the motor vehicle has been so rapid that the sport, to which no better name than the most awkward one of automobiling has been given, is hardly yet in the club stage. —*Editorial.*

Henri Fournier, race driver, is quoted in *Success* of January as follows: "I look to see all the ordinary work of transportation in the great cities of the world done without horses. Everything will be done with more speed so as to relieve congestion, but the most important item about the coming of the motor is its cleanliness."

Digest of the Leading Foreign Papers

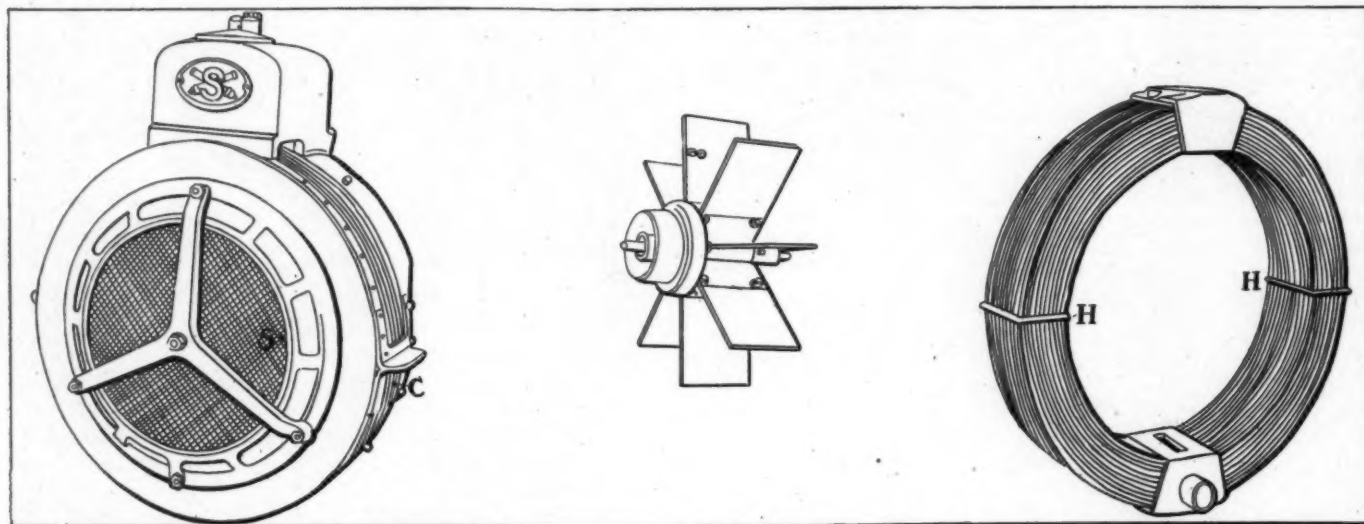


Fig. 1—General view of Solex radiator equipped with centrifugal blower. Fig. 2—The centrifugal fan. Fig. 3—Nest of smooth copper tubes in forced draft radiator adopted for all Paris omnibuses

THE principle of the centrifugal blower which has been applied for several years in

the United States in connection with air-cooled motors, such as the Frayer-Miller and the Franklin, has been adopted in connection with water cooling and a special radiator constructed for all the vehicles controlled by the General Omnibus Company, of Paris, after extensive competitive trials. The radiator in question, called the Solex, is the same that has been used for some time on Schneider and De Dion buses and the appearance of which is familiar to Parisians and visitors to Paris. One of the principal objects aimed for in the construction of this radiator is robustness, considering that the honeycomb radiator has been found too frail for withstanding the vibrations to which a radiator is exposed on commercial trucks and buses running on solid tires. The efficiency of the centrifugal blower, which is rated as five to six times higher than that of the ordinary automobile fan, gives the opportunity for combining the desired strength of construction, as well as low cost of production, with a correct and efficient system for regulating the temperature of the cooling water independently of the vehicle speed and somewhat in accordance with the variable heat generation of the motor. The fundamental idea of the designers seems to have been the simple and obvious one that if the positive-acting centrifugal blower is capable of improving the regulation of air-cooled engines, though it is difficult to lead the air currents so that they will absorb heat equally from all those parts of the cylinder surfaces which are in equal need of cooling, it should be doubly advantageous in connection with a radiator, if the latter is specially built with a view to giving the air currents unhindered passage over the surfaces to be cooled, at all motor and fan speeds. In the ordinary radiator, with a thrust or suction fan placed behind it, the resistance to the passage of the air over the water conduits is increased very much at high fan speeds through the formation of eddies due partly to the tubular shape of the air channels and partly to the irregular relations between the air currents and the air passages. The accompanying illustrations show the simple mechanical arrangement in the new radiator design by which these shortcomings in ordinary cooling methods have been avoided.

The ventilating fan, Fig. 2, is placed in the interior of a nest of copper tubes, Fig. 3, two bundles, H and H1, of these tubes being

Forced-Draft Radiator

bent in half circles and gathered into a collector B for the hot water at the top and another collector C for the cooled water at the bottom. The centrifugal fan F draws the air in through the opening around its axis and throws it out around the whole periphery, and in between the smooth copper tubes which are suitably spaced apart to allow the air to pass. The central air intake is protected by a screen S, Fig. 1, to reduce the quantity of gross impurities which a centrifugal fan is liable to draw from the atmosphere, and it is noticed that the arrangement of the tubes, in conjunction with their smooth surfaces, renders it easy to clean the cooling surfaces of whatever foreign substances may find lodgment there. The curved conformation of the tubes allows them to yield under the influence of vibrations or flexions of the chassis without straining the joints with the bronze collectors. The whole nest of tubes is protected against injury from the outside by means of a sheet metal casing, being secured to this casing by two bolts which pass through tubular channels in the collectors, still leaving the nest of tubes free to accept deformations, and the casing is mounted upon the chassis by suitable steel brackets. At the center of the casing a shaft is supported in front by means of an aluminum spider and at the rear in a steel bracket, and upon this shaft the fan revolves mounted upon two ball bearings more than 10 inches apart.

On top of the upper collector B there is mounted an aluminum tank T holding about 2 gallons of water, for a motor of about 30 horsepower, but the hot water from the cylinders is discharged into the collector. The author of the article mentions that this forced draft radiator was in use upon the Lefebvre tractor at the recent trials of self-propelled agricultural machines at Roubaix and Laon and proved to be the only one providing sufficient cooling for the hard-worked engines on those occasions.—*La Vie Automobile*.

OXY-GASOLINE FLAME FOR WELDING AND SOLDERING.—According to a somewhat indefinite report, gasoline, benzol, kerosene or alcohol may handily be used in the place of acetylene gas for autogenous welding or for soft soldering. To this end, the oxygen generator is simply connected by pipe or hose with a tank containing one of the fluids mentioned, and from it the gas mixture is piped under pressure to the burner, where, the report

says, it is heated by means of a small lamp. The flame is rather large, it is admitted, but the purity of the gas excludes all clogging of the nozzle, while the fuel is more universally obtained than acetylene or hydrogen and considerably cheaper.—From *Metall-Technik*, October 7.

[The flame, however, is not nearly hot enough to produce a quick, and therefore a good and clean, welding or metal-cutting job.—Ed.]

Uninflammable Imitation Celluloid

Among patented chemical inventions, Leon Labbé registers several related methods for producing imitation celluloid which is not inflammable and whose use in automobiles—for windows, fittings, body panels and perhaps elastic tires—might be found worth considering, the fire risk of real celluloid being eliminated.

The base of the substance is gelatine or casein or both, to which is added lac or jellied silica, to increase the strength and reduce the water-absorbing, hygroscopic properties of the base. Three methods are specified, numbered in the following 1, 2 and 3.

(1) A solution A of gelatine is prepared by heating 25 grammes of gelatine with 100 grammes of water to 65 degrees centigrade in a wet-bath. To this are added 5 grammes of acetic acid and thereafter 2 grammes of alunite. This mass is cooled preferably by artificial refrigeration, is wrapped in cheese cloth and squeezed, thereby passing through the meshes of the fabric in form of threads, which are received in a basin of water. It is then heated to 65 degrees centigrade, and 2 grammes of glycerine and 2 grammes of glucose are added. This compound is filtered. Then a solution B of lac is prepared. It can be made with alcohol, using 50 cubic centimeters of 90 degrees alcohol for 10 grammes of lac. Or it can be made with ammonia in the same proportions. It can also be made with water in the same proportions, but then some borax must be added, and the water with the borax must be preheated, whereafter the lac is added, and the whole is brought to the boiling point and filtered. The solutions A and B are now mixed, and the result, after evaporation or drying, is an imitation celluloid of fine quality and transparency.

(2) The solutions A and B are prepared as under 1. A third solution C is made of casein by adding 10 grammes of borax to 100 cubic centimeters of water, heating it, adding the casein, heating now to the boiling point and filtering. The solutions A, B and C are then mixed, and, after evaporation and drying, the compound is suitable for articles which need not be wholly transparent.

In evaporating and drying the following is observed. The mixtures of A and B and also that of A, B and C are allowed to evaporate until they reach a thick sirupy consistency and are then run into molds. When hardened sufficiently to be removed from the mold, the formed article is at once plunged into a bath which renders the albuminoid matter insoluble. This bath may be on a base of formic aldehyde or of alum or acetate of aluminum, or of any equivalent substance capable of producing the desired result at a strength preferably not exceeding 5 per cent. The bath should impregnate the article completely, and the duration of the submersion in it must depend upon the thickness of the material. Thereafter the article is dried completely in a drying room.

(3) This method is based on the property which albuminoid solutions possess, of precipitating solutions of silica in the form of collo-silicates which are insoluble in water, and on the use of silico-glycerine jelly together with these collo-silicates. Silica, besides being cheaper, has the advantages over lac that it gives greater strength and hardness and that it can enter into the composition of the finished product in larger proportions without reducing the transparency.

The proceeding for obtaining the albuminous collo-silicate may be as follows:

Three solutions D, F and G are first prepared; namely:

D, a silicious solution, by adding to a weak solution of alkaline silicate a great excess of hydrochloric acid, which leaves the silicate in solution. If, on the other hand, too little acid is added, the silicate will be precipitated as a jelly.

E, a silico-glycerine jelly; to obtain this, an alkaline silicate is treated with hydrochloric acid, as before, but taking care not to use any more acid than is necessary to precipitate the silica from the solution of alkaline silicate. Thereafter the siliceous jelly obtained is mixed with glycerine and heated to the boiling point.

G, an albuminoid solution, which can be, for example, a solution of gelatine, or may be of casein, or of gelatine and casein mixed. This solution is obtained as mentioned under 1 and 2.

When these three solutions are prepared, the silica solution D is poured little by little into the albuminoid solution G, thereby forming a precipitate of albuminous collo-silicate, which is now neutralized by the addition of ammonia or caustic alkali. This produces a thick jelly in which much water is retained. The water is eliminated, either partly or totally—according to what product is wanted—by treating the jelly with absolute alcohol.

This jelly of albuminous collo-silicate is then mixed and worked (with pestle or equivalent means) into the glycerine jelly F until the mixture is uniform, and the complete insolubility of the compound is secured by treating it in a bath, such as mentioned under method 2.

Drying and compression complete the process, and the flexibility of the product may be varied at will by modifying the proportion of glycerine. A scale of variations in strength and hardness may be established by varying the proportions of albuminoids and of silica, the latter determining the hardness of the product.

When transparency is not required, casein may be extensively used, reducing the cost of production. Coloring matter, whether the colors are soluble or opaque, should be introduced in the albuminoid solution before the siliceous solution is poured into it.—From *Chimie Industrielle*, November.

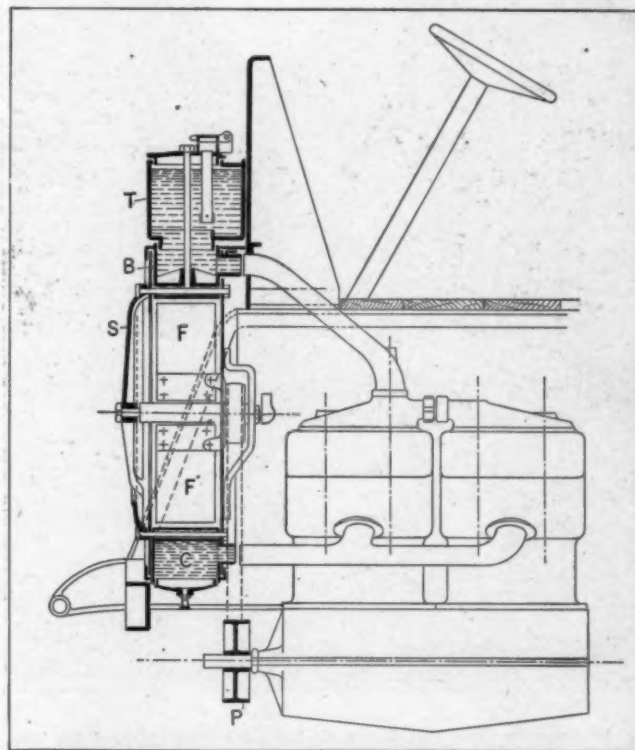


Fig. 4—Section of forced draft radiator as mounted on a Paris omnibus with low-hung motor under driver's seat. V, centrifugal blower; B, upper collector; C, lower collector; F, spider supporting fan shaft; + + +, ball bearings; H, fan pulley; G, driving pulley; M, belt

Automobile Metallurgy Made Easy

By E. F. LAKE

Part VI

Bessemer Steel — Its Manufacture, Physical Qualities and Chemical Composition

(NEXT WEEK—OPEN-HEARTH STEEL)



UGE quantities of steel are turned out by the Bessemer process; in fact, a much larger tonnage of steel is turned out by the Bessemer process than by all of the other processes with which steel is made. In making steel this way the iron ore is melted in a furnace and what is known as cast iron is taken out of a tap hole at the bottom of the furnace and run into clay-lined ladles on car trucks. These ladle-cars are run to the Bessemer converters, Fig. 1, and the molten metal poured into them. The residue from the iron ore is called slag and being lighter than iron, it floats on the top of the molten metal in the ore furnace. This slag is drawn from the furnace through another tap hole that is located higher up.

The difference between the various iron products is that cast iron usually contains from 3 1-2 to 4 1-2 per cent. of carbon and the others less than this. After the percentage of carbon has passed 0.90 it will not thoroughly dissolve in the iron and separation begins. Above this percentage some of the carbon segregates in the iron in the form of graphite. This separation and formation of graphitic carbon usually becomes quite pronounced when 2 per cent. of carbon has been reached. Divisions are thus usually made on the following basis: Iron products containing over 2 per cent. of carbon are classed as cast iron; those containing between 0.10 and 2.00 per cent. are called steel and those with a carbon content below 0.10 per cent. are called wrought iron. When the carbon is below 0.30 per cent. steel is soft and cannot be hardened enough to prevent its being cut with a file. It is then called machinery, soft or low carbon steel. When the carbon content is between 0.30 and 2.00 per cent. a steel can be hardened enough to enable it to cut other steels. It is then termed half hard, hard, tool or high carbon steel.

Thus the molten cast iron when poured into the Bessemer converters contains a large amount of graphitic carbon which has to be removed to make it into steel. To get this carbon out air is forced through passages opening into the bottom of the Bessemer converter, Fig. 2. The air passing up through the molten metal causes it to boil and oxidize out all of the silicon and manganese and most of the carbon. After these have been burned out of the molten metal enough more is then added to give the finished steel the properties that are desired, this being the easiest way of controlling the amount. When this has been done the converter is tipped over, as shown to the right in Fig. 2, and the steel poured into ingot molds, from which it is taken to be rolled, hammered, pressed or forged into the desired shapes.

This is the simplest process by which steels are made and consequently they are the cheapest steels that are obtainable. Most of the railroad rails and structural steel shapes are made by this process, the cast ingots being taken directly from the



Fig. 1—Bessemer converters during the blow and when the steel has been poured out. On the left can be seen the converter from which the molten steel has been poured while that on the right was "blowing" when the photographer snapped his camera.

converter to soaking pits. In these they are soaked in heat until they arrive at the correct temperature for rolling, when they are rolled into the desired shapes. All kinds and shapes of bar steel, wire, etc., are also made by this process and sold in the open market.

The ordinary carbon steels, with any percentage of silicon, manganese and carbon that is desired, can be made in the Bessemer converters, but impurities such as sulphur and phosphorus cannot be reduced to as low percentages as when other methods are employed in making steel. Then, again, the air passing up through the molten metal causes it to absorb considerable quantities of oxygen, hydrogen and nitrogen, either in the form of occluded gases or in large enough segregations to form blowholes. Steels made by the other processes, do not absorb the gases in such large amounts and they are, therefore, denser, tougher, stronger, etc., than those made by the Bessemer process. Thus, while Bessemer steel is the cheapest steel obtainable, it does not have the tensile strength or other mechanical properties that steels do which are made by other processes.

In the manufacture of steel rails titanium has been added to the molten metal as it is poured from the Bessemer converter into a ladle, and it almost entirely removes the occluded or segregated gases mentioned above. It thus adds to the strength and wearing qualities of the metal. Railroad rails, which are subjected to the frictional wear of car wheel flanges as they roll over them, have been made to last four times as long as the ordinary Bessemer steel, and especially when used on sharp curves where this frictional wear is very high. The increase in cost of treating steel in this manner has been made considerably less than \$2.00 per ton.

This would indicate that gears, frictional clutches, shafts, brakes and some other automobile parts might have a greater resistance to frictional wear and be tougher if titanium were added to the metal. They might even be made from a titanium-treated Bessemer steel. For such important parts, however, it would be better to use the titanium in steels made by other processes as such injurious elements as phosphorus and sulphur could be reduced to lower percentages. The difference in cost between Bessemer steel and that made by the next best process is but the fraction of a cent per pound on some grades and hence it hardly pays to use it for automobile parts.

Such parts as the brackets that hold the steps to the frame, pedals, change-gear lever, hood retainers and others that do not have any particular strains put upon them can be made from Bessemer steel without weakening the car. Many times such parts are made of brass or bronze for ornamental purposes, and Bessemer steel is much stronger than these. Its price is so much cheaper that it can profitably be used on the cheaper cars. The frame, brake bands, frictional clutch discs and similar parts that require considerable resistance to strains and frictional wear have been made from ordinary Bessemer steel even though they should have been made from a better grade. Many times dishonest dealers sell Bessemer steels for those made by more expensive processes, or they mix Bessemer and open-hearth steels together to enlarge their profit. This, however, is a subject that must be taken care of by the buyers, as it is difficult to tell one from the other.

As a general rule, Bessemer steel should not be used in any part of a motor car, although the titanium-treated Bessemer steels might give good results when used for certain parts, and ordinary Bessemer steel for parts that are not important, when cheapness is a factor.

The high strengths that can be obtained in steels made by other processes cannot be given to those made in the Bessemer converter. Any gases present are bound to lodge between various molecules of the mass and separate them so they cannot cling together. This entirely destroys the cohesive force at that point, and consequently lessens it in the whole mass. It is difficult to obtain Bessemer steels with a tensile strength of 125,000 pounds per square inch or an elastic limit of 100,000 pounds. Another reason for this aside from that given above, is that most

Bessemer steels have a low percentage of carbon, the higher carbon steels usually being made by other processes.

Carbon greatly alters the tensile strength of steel when it is properly heat-treated and the impurities reduced to a minimum. As an instance of this it is very difficult to show a tensile strength above 100,000 pounds per square inch with a steel that contains less than 0.20 per cent. of carbon, while the elastic limit of such a steel runs from 60,000 to 80,000 pounds per square inch. Give a steel, however, 0.50 per cent. of carbon, reduce the impurities to a minimum and properly harden it and the tensile strength can be raised to 250,000 pounds per square inch and the elastic limit to 230,000 pounds. Thus, a difference of three-tenths of 1 per cent. of carbon, or less than one-three-hundredths of the mass in which it is placed, will increase the tensile strength 150,000 pounds, or make it 2 1-2 times the strength of the lower carbon steel. This is out of all proportion to its volume and one of the wonders of metallurgy.

Such high strengths, however, are not obtained in Bessemer steels, as the impurities are not removed to the extent that they should be. The ordinary Bessemer steels, such as are produced for structural shapes and railroad rails, have a tensile strength of about 115,000 pounds per square inch and an elastic limit of 80,000 pounds. The addition of titanium to this steel for the manufacture of rails has raised this tensile strength to nearly 125,000 pounds per square inch and the elastic limit to over 95,000 pounds. To expect more strength than this from Bessemer steels is expecting what is rarely obtained.

Honorary Kinks in Aviation Language

The French War Department has decided that hereafter every aeroplane found suitable to represent the French colors in military pursuits shall be known as an "*avion*" and that the first special weapon to be devised and found of signal value for use from "*avions*" shall be termed an "*ader*," both terms being accepted as common nouns. These new names are in honor of Clément Ader, whose book *L'Aviation Militaire*, though written long before the triumph of the Wrights, reads like a prophecy, and whose aeroplane, actually built and tried at the same date and which was called *L'Avion* by its maker, would have flown if the science of motor building had been more advanced.

Following upon the official authorization of the new term "*avion*," it is at once proposed in *L'Auto* to adopt "*avier*" as the verb meaning "to fly" instead of "*voler*" whose double meaning, "to steal" as well as "to fly," is inconvenient. The conjugation of "*avier*" would bring about some new linguistic collisions, however. "*J'avie*" does not sound good for "I fly" and "*nous avions*" for "we fly" caroms with "*nous avions*," "we had." Probably "*avier*" will have to be turned into an irregular verb, as irregular in its form as in its connotation.

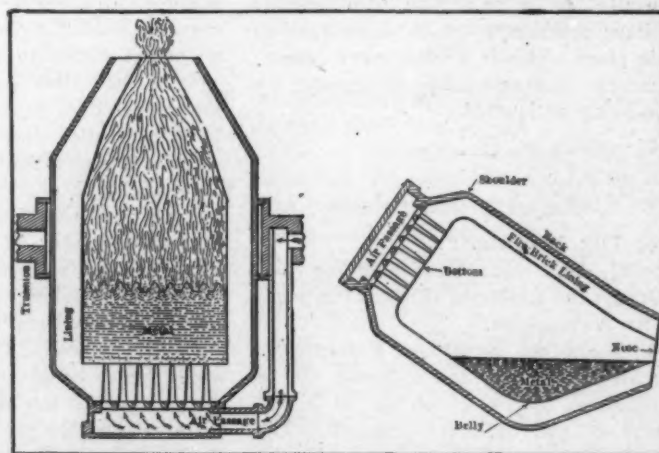


Fig. 2—Upright and tilted Bessemer converter

Letters Answered and Discussed

Brake Adjustment

EDITOR THE AUTOMOBILE:

[2,967]—The brake on my car will not hold very well when I apply it and I have to use the emergency brake continually. There is no turnbuckle on the car, but instead a sort of half turnbuckle which connects to the arm as in Fig. 1. How may I adjust the brake?

Pittsburgh, Pa.

HARRY BINKS.

If you will take off the fitting you term a half turnbuckle and insert a screwdriver

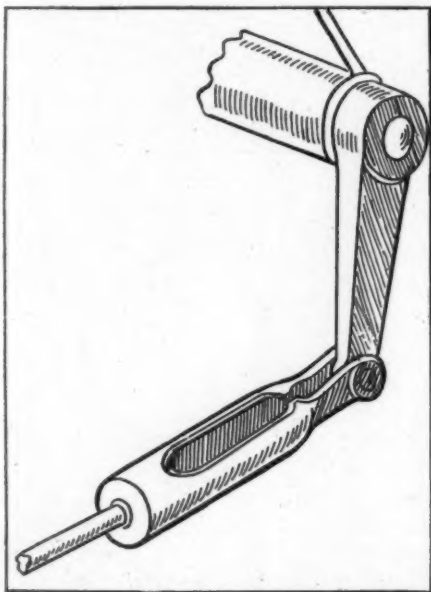


Fig. 1—Brake adjustment fitting in use which is not accessible

as shown in Fig. 4 you will be able to turn it over and tighten up on the adjustment. While at the work it may be well to have a fitting such as is shown in Fig. 2 installed by a repairman who possibly will have sufficient spare parts on hand to put in place. This is a much more accessible means of making the adjustment, the other being antiquated.

Both Are Harmless

EDITOR THE AUTOMOBILE:

[2,968]—Will you please give me your opinion on the following through the pages of THE AUTOMOBILE:

(1) I am the owner of a four-cycle four-cylinder touring car equipped with a dual ignition system consisting of a dry battery set and Splittorf magneto. The motor has one set of spark plugs. For the past month the dry battery set has been dead and I have been running entirely on

The Editor invites subscribers to communicate their automobile troubles and personal experiences, stating them clearly on one side of the paper. If the nature of the case permits, send a sketch, even if it be rough, in order to assist to a clearer understanding. Each communication will receive attention in the order of its receipt, if the writer's signature and address accompany it as an evidence of good faith. If the writer objects to the publication of his name, he may add a nom de plume.

the magneto. Will this cause any undue strain on the motor or ignition system? I have no trouble in starting as the motor generally starts on the first turn and never kicks back.

(2) In order to prevent freezing over night I always draw the water from the radiator when I put the car in the garage and while the water is still hot. At the same time I let the steam out of the radiator by removing the cap from the top. Is this likely to harm the motor?

Spokane, Wash.

INQUIRER.

(1) This will not harm your motor in the least. Care should be exercised, however, that you do not unexpectedly get a kick back.

(2) This will not harm the motor.

Wants Tire Facts

EDITOR THE AUTOMOBILE:

[2,969]—I think a matter of interest to car owners would be a few comments and figures on the use of larger size tires than are the regular equipment on some stock cars. For instance, one car advertised to weigh 2250 pounds was fitted with 32 x 3½ inch tires and really weighed 2450 pounds. The tires supplied called for a pressure of 80 pounds. Almost all other tires of the same size call for a pressure of only 70 pounds. Are the above tires sufficient to carry a loaded 5-passenger car? Would an actual saving in tire expense result if 33 x 4 inch tires were used at an additional cost of approximately \$15 per tire? Does a smaller diameter tire on a front wheel cut easier than a larger size.

Pittsfield, N. H. WILLIAM B. ELY.

A 3½ inch tire should never carry more than 600 pounds. In a car weighing 2450 pounds, with the addition of five passengers, each weighing 150 pounds, each tire would be called on to bear a weight of about 800 pounds. The tire you speak of would hence be greatly overloaded. With the 33 x 4 inch tire the load would still be too great and the car would be undertired. The correct tire to use in this case would be a 34 x 4½. A smaller tire would be apt to be cut more rapidly than a larger one.

Qui Sait ?

EDITOR THE AUTOMOBILE:

[2,970]—The announcement of H. E. Coffin's address before the English Engineers brings to my recollection the remarks of an English correspondent of *Auto-Car*, London. This gentleman, in writing the account of the last Madison Square Garden Auto Show, has the following to say, as published in *Auto-Car* January 28, 1911, over the initial "N:"

"My impression is that cleanness of design is not a characteristic of American cars. Only two manufacturers showed cars which left nothing to be desired in this respect."

These remarks are particularly timely in connection with Mr. Coffin's address on clean chassis design.

You may publish this, if you wish, but my chief object is to ascertain the names of the two manufacturers referred to.

CHRISTOPHER LIPPS.

Baltimore, Md.

Tips from a Repairman

EDITOR THE AUTOMOBILE:

[2,971]—Gentlemen: In the number of December 7 I read the inquiries from the following subscribers, and having had quite a good deal of experience as repairman, etc., I would add this to your answers, if you care to publish them:

[2,939]—M. E. Long.—The trouble you speak of can be remedied by gas bags, at a

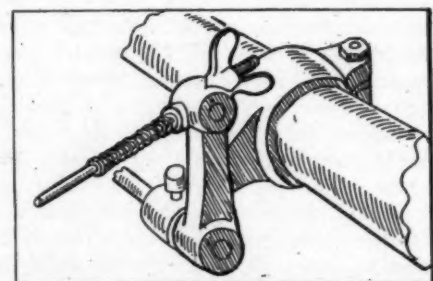


Fig. 2—Modern form of brake adjustment which may be installed with spare parts

cost of 25 cents each, to go between end of gas line and lamps. These will not only collect the water, but have the advantage of giving you practically an even pressure of gas at the burner, as they compensate to a large extent for the change of flow of gas from the generator caused by varying road conditions. They are easily cleaned and do not clog.

[2,943]—J. R. Day.—If you will take out the screw block in your drag link, and the spring, you will find two concave blocks

that fit about the ball on the steering arm. Take these out and fit them around the ball and see if their edges do not come together and still leave some shape. Grind down the edges until there is a space of about 1/16" between edges when fitted around ball. You will find, I think, that that remedies your trouble.

[2944]—C. J. Andrews.—If there is no drain cock on the bottom of your radiator look for a pipe plug. All radiators have some provision for drawing off water. Also look for plug under water jacket and

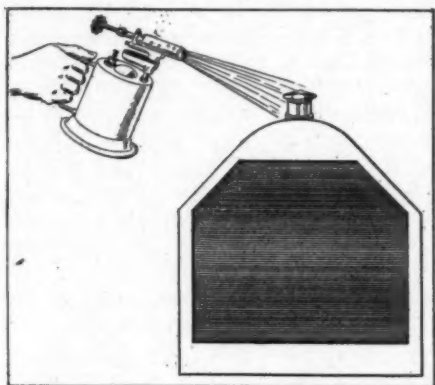


Fig. 3—Method of removing radiator cap by gentle heating with torch

between cylinders, if yours is a vertical motor, cast in pairs. If there seems to be no other way loosen hose clamp and pull hose off bottom of radiator.

New Haven, Conn. W. B. UTLEY.

Speaks from Experience

Editor THE AUTOMOBILE:

[2,972]—Referring to letter No. 2953, signed by Mr. H. L. Shepard of Rochester, N. Y., relating to trouble with his headlights on Ford car, I think that if Mr. Shepard will set his vibrators as light as possible that he will have no trouble with his magneto operating his car and lights at the same time. I have found several cases similar to his and the vibrators were screwed up so tight that the magneto could hardly operate the vibrators alone, to say nothing about lighting the lights at the same time. The vibrators should be loosened up just as much as possible and have the car run, then give them a slight turn to stiffen them up a little, sufficient to operate the car at high speed, then I think he will have no more trouble in this direction.

I do not find that the valve stems need readjustment as the wear on the valves and the grinding takes up any wear on the end of the valve stem.

Watertown, N. Y. C. D. WARNER.

Radiator Cap Stuck

Editor THE AUTOMOBILE:

[2,973]—Every time I desire to remove the radiator cap in order to replenish the supply of water before starting out I have trouble in removing the cap from the

radiator. I have been hammering it lately, but do not wish to continue this as I am spoiling its appearance.

TROUBLED.

New Haven, Conn.

If you have a torch in the garage it could be lighted and then applied to the radiator cap in the manner shown in Fig. 3. Since the heat reaches the cap first it will expand before the metal upon which it is fitted. In this way you will find that it may generally be removed.

Has Trouble with Single Cylinder

Editor THE AUTOMOBILE:

[2,974]—I have a single-cylinder car with which I am having all kinds of trouble. I cannot get an explosion strong enough to give one turn. The ignition system is all right as I have a good coil and get a good hot spark. The timing also appears all right, but I do not get an explosion even when I prime the motor.

M. M. J.

Salem, Mass.

Your troubles may be due to a variety of troubles and the symptoms described are not detailed enough to accurately determine their exact nature. However, the seat of trouble may lie in the fact that the compression is not good. This would most likely be the case if the motor were old. If it is a new motor, since the ignition is as it should be, the cause of the trouble may be found in a faulty carbureter adjustment.

Compressed Air Starter

Editor THE AUTOMOBILE:

[2,975]—(1) Would it be practical to use compressed air in an automobile using a gasoline engine to compress the air, superheating by means of the exhaust, and utilizing a double-acting engine for the final drive? Such an arrangement it would seem would give the utmost flexibility provided the losses are not too great.

(2) I would also ask if a two-cycle engine is constructed with a sliding sleeve valve admitting the charge of gasoline at the head of cylinder instead of through a port at the end of piston stroke?

It would seem that such a construction would make a very satisfactory motor, provided the charge is admitted through four ports on opposite sides of the cylinder simultaneously so that the currents of air entering the cylinder would impinge on each other in such a manner that the new charge would be more thoroughly diffused throughout the combustion space, and a more thorough scavenging result.

(3) Has any method of scavenging a two-cycle motor ever been put to practical use?

MEDICO.

Grafton, W. Va.

(1) It would not be practicable, for even if such an outfit could be made to run satisfactorily it would have to have a 100 per cent. efficiency in order to derive

as much power from the air as would be given up by the compressors of the gasoline motor, so that the motor would have to have the same horsepower as those now in use. Added to this motor would be the extra weight of the air and double-acting engine outfit which would make the whole plant too large and heavy for any self-propelled road vehicle.

(2) The complications of the manifolds necessary to carry out this scheme would more than overbalance any good which could possibly result from its use.

(3) Only in some of the larger double-acting types, such as the Koerting motors where an auxiliary air tank was employed to allow air to flow in under pressure and expel the dead gases.

What Is a Second-Hand Car?

Editor THE AUTOMOBILE:

[2,976]—You would oblige us very much by giving us a clear and concise definition of new car, demonstrator, and second-

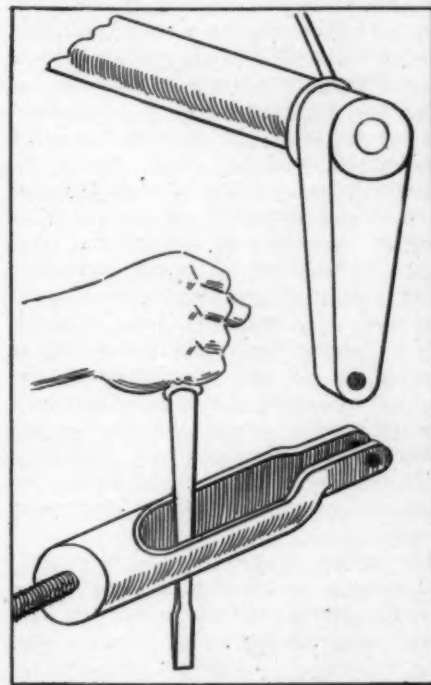


Fig. 4—Method of adjusting the old-fashioned brake fitting

hand car. We have been having some controversy about this subject.

One of the parties contends that a car which has been used only a short time and only for demonstrating purposes is still a second-hand machine. I think that a car cannot be called second-hand until it has been sold by an agent to an individual and then offered by him for sale the following season.

BERLEW & SUNDERLAND.

Any car which has been in active use, whether for demonstrating purposes or not, cannot be called a new car. The number of miles that the car has been driven generally determines its value. Anything not new is second-hand.

Little Bits of Motor Wisdom

Pertinent Pointers for Repairman and Driver

UNDERSTAND YOUR LUBRICATING SYSTEM.—There are very few general forms of lubrication in use at the present day so that a general understanding of the principles in use in each would aid materially in giving the average motorist the general lines along which to follow should he investigate the oiling system on his new car or, in case he has neglected this important feature in his old car, to turn over a new leaf and become familiar with those principles upon which the life of the car depends to a large extent. The damage done to cars owing to the neglect of the cylinder and other lubrication far exceeds any other damage in its far reaching results. The cost of making repairs when the damage has been caused through neglected oiling of a given part is only equaled by the amount of money paid over for such damages as are caused by collision and other varieties of wreck.

Every motor car owner should understand the lubrication of his car before he takes it upon the road for the first time. If the owner does not care to drive but turns that part of the pleasure over to the chauffeur, it is upon the latter that the duty of keeping the repair bills as low as possible will fall and upon whom the life of the car depends. The general principles may be readily grasped by the average business man since they are merely a product of common sense and do not involve any dark and mysterious mechanical secrets.

The first system which may be considered since it is found to a great extent upon the cars in use today is what may be called the circulating splash system. This

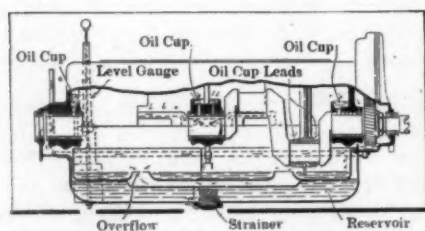


Fig. 1—Depicting the oil cups and troughs for National splash system

system is also generally known as the constant level splash system and is perhaps the cheapest system possible to install upon a car and at the same time maintain an efficient lubrication at all times. When this system is used the crankcase of the motor is generally a very deep casting in which the lower part forms the reservoir and is

capable of carrying anywhere from 3 to 7 quarts of oil. The reservoir or base chamber generally slopes toward the rear of the casting so that it is deeper at this end. At the lowest point a pump which may be of either the plunger or gear type is installed. For the benefit of those familiar with the details of these two types of pump it may be said that in the plunger type the oil is sucked into a cylinder by means of a piston or plunger and then upon the next succeeding stroke is forced through a lead pipe in the direction in which it is desired to carry the oil. The gear pump, which is more commonly used for oil circulating purposes owing to the fact that ball check valves which are prone to stick are to a large part eliminated, consists of two spur gears which intermesh. The oil is drawn between the rapidly revolving gears and squeezed up through the outlet lead.

From the pump the oil is either led directly to the splash chambers or in other cases it is led to the sight feed which is generally located on the dash. The oil pump is driven from the camshaft by means of gearing or from the magneto and water pump shaft through gearing or through a vertical shaft, the lower end of which carries the gear pump and the upper end carries the timer. When the oil pump is of the plunger type it is driven through a crank or eccentric since a reciprocating motion will have to be imparted to the plunger.

The oil lead from the pump, whether it passes through a sight feed on the dash or passes directly to the crankcase, supplies the oil directly to the troughs which form the basis of this system. These troughs are so arranged that the ends of the connecting-rods in their downward sweep pass into them for a depth of about 3-16 inch. One trough is placed beneath each connecting-rod and the main oil lead which takes the supply from the pump is so designed that it will keep the trough full under all conditions of travel. The troughs are carried upon a sort of horizontal partition or tray which separates them from the lower part of the base chamber which contains the reservoir.

The rapidly revolving connecting-rods sweep down into the troughs and churn the oil into a fine spray which will be found all over the entire crankcase. This spray penetrates the cylinders and is drawn up by the pistons and distributed by the rings over the cylinder walls. The cylinder walls are thus amply lubricated and the supply of lubricant constantly renewed

by the fresh supply drawn up by the pistons. The wrist pins are often made hollow so that there is a certain amount of oil which finds its way through the open ends; this will find its way through a duct which is cut through the upper connecting-rod bearing and hence lubricates the point. The lower connecting-rod bearings are generally lubricated by the scoop which is on the bottom of the connecting-rods. This scoop is hollow and permits the oil to flow through it and thence into the bearing. If there is no scoop fitted to the connecting-rod the bottom bearing cap is generally pierced by a hole through which the oil penetrates as the connecting-rods plunge into the troughs.

The camshaft and main bearings are

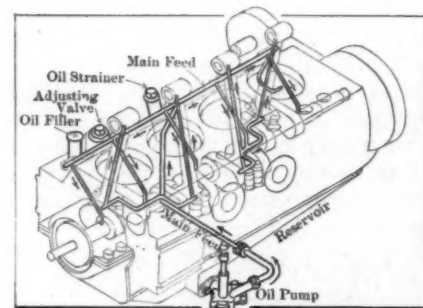


Fig. 2—Showing oil leads on the Knox cars using force-feed system

lubricated by the oil spray which will be very thick in the crankcase and will be found to reach every point in sufficient quantities to lubricate any part. In order that the supply to the main bearings will be constant, it is the custom of some manufacturers to place a small cup or pocket above them in which the oil will be caught and from which it will flow directly to the main bearings. The timing gears are often provided with either a pocket in the same manner as the main bearings or in other cases a separate lead is led to them from the pump and the oil allowed to flow into the casing and thence drain back to the troughs in the main part of the crankcase.

Since the oil is continually supplied to the crankcase in greater quantities than it is being used there would be an accumulation of oil above the troughs unless there was some means of draining it off. This is provided by a series of overflow pipes in some cases and in other cases it is provided by placing the overflow outlets in standpipes. The overflows in any case are so arranged that they will be at the correct height to take the oil away from the

upper part of the crankcase before it accumulates to such a height that there will be an oversupply of oil thrown up into the cylinders which would cause them to smoke. The overflows take the oil from that part of the crankcase which contains the troughs and leads it back to the lower part in which the reservoir is found.

In this manner the oil is used over and over again, for as soon as it reaches the crankcase it will again be drawn up by the pump and sent through the oil leads again, whereupon it will finally reach the crankcase after passing through the system. From time to time more oil will have to be added to the crankcase to replace that which is burnt up or is used in other ways. If there is a sight-feed on the dash the condition of the oil will be known to the operator by his observation of the supply passing through the glass. It is necessary that the supply be renewed in the crankcase once every month. When this is done the old supply will have to be cleaned out and the crankcase flushed out with kerosene. It is a good plan to allow the motor to turn over for about 3 seconds with kerosene in the base so that the old oil

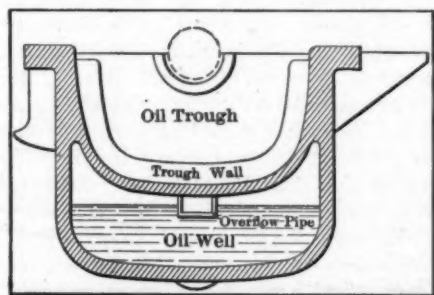


Fig. 3—Form of transverse section through crankcase of splash lubricated motor

will be flushed from the pump. The screen which is placed in the circulation line and through which all oil that enters the pump must pass should also be well cleaned out or else its purpose will be defeated owing to the accumulation of dirt which will eventually be forced through the meshes of the screen. Small details may vary on cars of different makes, but this is a general view of the splash system.

COMBINATION FORCE-FEED AND SPLASH.

—This system will be found to vary very slightly from the purely splash system. The oil is generally carried in the lower part of the crankcase in the same manner as that described for the splash system. The pump is placed in a similar manner, but the oil instead of being led to the splash troughs directly is led to the main bearings through independent leads. A sight-feed is placed on the dash on some makes of cars and when this is done the type used may be either one which will show the flow to each main bearing or it may on the other hand consist of a single glass which indicates the flow as a whole.

The oil will flow to the main bearings under the pressure given by the pump. The lubrication of these bearings will hence be positive and the same under all circumstances. The oil then passes from the bearings into the troughs on either side and is picked up by the connecting-rods and thrown up into the cylinders in the same manner as described for the splash system. Overflow pipes are provided so that the oil will pass back to the reservoir from where it is picked up again by the pump after passing through the screen and thence goes through the system again.

The same precautions will be necessary in cleaning the crankcase every month in order to insure a fresh supply of oil to the motor. The drain plugs in the bottom of the crankcase will have to be removed and the old oil allowed to flow out at least once a month or after every 500 miles. The kerosene is then introduced through the oil filler hole or through the breather pipe and the engine allowed to run in the same manner as above described.

It will be seen that the splash systems and the combination do not vary to any great extent. Occasionally, however, a combination system will be found in which the oil is not only fed to the main bearings but from there passes through a hollow crankshaft to the other bearings, and occasionally up a lead along the connecting rod to the wrist pin bearing. In this case the only parts of the mechanism which are lubricated by the splash are the pistons and the camshaft bearings. The system is on the whole more of a force-feed type than a splash.

THE FORCE-FEED SYSTEM.—When this is used the reservoir may either be in the base of the motor or not, according to the method used. If the oil is recirculated the reservoir will be in the base, if not the reservoir is independent of the motor and is generally in a small tank on the side of the crankcase, but is not an integral part of the same. The recirculating type may be considered, the two principles being the same. The crankcase is not subdivided by either horizontal partitions or by vertical troughs, as is the case in the splash system of lubrication. These partitions are not required because the connecting-rod does not splash into the oil in any case as this would cause the motor to smoke. A mechanical oiler is fitted which consists as a rule of a number of small plunger pumps mounted side by side and which are all operated from the same shaft which passes through the box and upon which a small crank is fitted for each pump. A lead runs from each of the pumps to some part of the motor, either the main bearings or other bearings throughout the mechanism, and the oil will be driven through these at a pressure which may be regulated and which will vary under the different conditions of use of the car. For city driving

a pressure of two pounds will be found sufficient for all cases, while in the country or for racing purposes the pressure required will be considerably in excess of this. A pressure gauge is often located on the dash in place of a sight-feed when this type of lubrication is used and the pressure on the gauge will drop when the supply of oil begins to diminish appreciably.

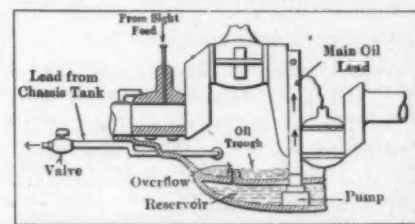


Fig. 4—Auxiliary tank used on the Royal Tourist cars with splash system

The crankshaft is made hollow and is drilled so that it will register with a similar drilled duct in the main bearing bushing. As the crankshaft turns about, there will be a quantity of oil forced into it at each revolution during the time that the two ducts are opposite each other. During the other part of the revolution the oil will flow into the main bearing itself and lubricate it. There will be a quantity of oil thus forced into the center of the crankshaft against the slight centrifugal force encountered upon entering the shaft. This oil will flow through the shaft until it reaches the crank cheeks, through which it will be thrown by centrifugal force owing to the large comparative radius of the same. The oil thus finds its way to the connecting-rod bearing. The connecting-rod is fitted with a small tube of copper, through which the oil is carried to the upper end and thus into the wrist pin bearing. Whenever the opening leading to wrist pin lead registers with the opening in the connecting-rod bearing bushing a stream of oil will be forced into the lead. This will gradually work its way to the wrist pin, which will be lubricated in this manner. The wrist pin is very often pierced by an oil hole so that the lubricant may flow through this member to the walls of the cylinder. The cylinder walls are also lubricated by the additional oil which is thrown upon them by the spray that leaves the bearings at the lower end of the connecting rod owing to the great centrifugal force at this point.

The oil flows back into the reservoir in the bottom of the crankcase and is then strained and drawn through the mechanical oiler again. The process of cleaning is carried out monthly in this system as in the splash and combination methods of oiling. The mechanical oiler should also be flushed out as well as the crankcase itself as the dirt and grit which will finally collect in any circulating system is apt to find its way into the oiler. The ball check valves in the mechanical oiler should be kept clean, as dirt stops the oil flow.

My Ideal 1912 Automobile

Readers' Conceptions of What Next Year's Car Should Be

Experienced Driver's Views

Editor THE AUTOMOBILE:

YOUR readers' conceptions of the ideal car interest me, and I should like to beg a little space in your valuable columns. I should like particularly to know if any of your readers are inclined to agree with me.

My views of the ideal car run thus: The motor should preferably be a six-cylinder four-cycle one, with the cylinders cast singly or in pairs. The bore should be 4 inches and the stroke $5\frac{1}{2}$ or 6 inches (if a four-cylinder motor the bore should be $4\frac{1}{2}$ inches and the stroke 6 inches). It should be water-cooled, copper water-jacketed, and the circulation should be maintained by means of a gear-driven centrifugal pump. There should be a tubular radiator with copper plates. The valves should be of the poppet type, $2\frac{3}{8}$ inches in diameter, enclosed, and all on one side. The splash oiling system maintained by force-feed pump into the crankcase with sight-feed on the dash should be included. All bearings where possible should be provided with grease cups, and the ignition should be by Bosch magneto or dynamo which, through storage system, could also be used to start the car and to light it.

A Stromberg carbureter should be used or, possibly better, an individually designed carbureter built for and adjusted to the engine and with provision for an air valve operated from the driver's seat for use when coasting on compression. The clutch should be a leather-faced cone of the Renault type, and a straight-line drive; one or two protected universal joints and an adequate torsion bar should also be included. The transmission should be optional, preferably of the selective sliding-gear type, with four speeds forward and reverse, direct drive to be on the third speed with a ratio of 3.3 to 1; fourth speed over direct and geared 1.7 or 2 to 1. Or if preferred it could be selective sliding with three speeds forward and reverse, direct on third and geared 3.3 to 1.

For my own driving on a car of such horsepower I should prefer the four-speed transmission, but for the standard cars I think the three-speed would be the better on account of the fact that most of the cars would probably be purchased by men as their first cars, making it possible that they would ask too much of the over-direct and would ignore it.

The frame should be a pressed channel section steel, thoroughly reinforced, with a drop at the dash line and a rise again at

Readers continue to demonstrate their interest in the ideal car and the specifications which are submitted show a wide range of taste and requirements. In view of the interest shown the Editor continues to extend the invitation to all who entertain ideas on this absorbing topic, to submit their opinions for publication. The description should be legibly written on one side of the paper and signed by the sender, although if it is so desired the name will not be published.

the rear axle to allow the body to hang low. The body should be straight line across the bonnet and doors, thus allowing plenty of height for the seat and lessening the unsightly high seat back above the top of the body line.

The steering column should have rake, this together with plenty of leg room in the front seat being the only things that will give comfort in touring. The steering wheel should be in the driver's lap, and not so far away as to necessitate reaching out or up for it. The spark and throttle levers should be on the steering wheel on a semi-circle, the same to pull toward the driver to open the throttle and to advance the spark. The drive should be right hand, with the gear control levers also on the right. If necessary, however, to keep the body narrow, these latter could be put in the center. The wheels carried should be 37 inches by $4\frac{1}{2}$ inches or 38 inches by 5 inches, with quick detachable tires. The front axle should be of the ball-bearing type, I-beam section, while the rear axle should be a full-floating Timken. The brakes should be internal expanding and external contracting on the rear axles, the brake drums being 18 inches by $2\frac{1}{2}$ inches.

The gasoline should preferably be fed by gravity, but if necessary to keep the body low pressure feed should be employed. A gasoline gauge should also be placed on the dash. The wheelbase should be from 124 to 130 inches. The car should be fully equipped with top, wind shield, speedometer, etc.

L. M. G.

Jersey Shore, Pa.

Has Views of His Own

Editor THE AUTOMOBILE:

Perhaps I am a little late in expressing my views of the 1912 car, but I trust that you will see fit to publish them nevertheless.

As I do a great deal of driving regardless of the weather I would prefer a car having a little reserve power, say one with from 40 to 50 horsepower. The motor

should be of the improved water-cooled, six-cylinder type, and it should be a T-head affair. The valve springs should be inclosed in such a manner as to be easily accessible if need be. I would prefer that the cylinders be cast in pairs, as I am not very favorable to the monoblock construction. The Knight type of engine would be preferable, also, as it is the coming type on account of its noiselessness and smooth running. The size of the cylinders should be 4 inches by $5\frac{1}{2}$ inches, and while this is not an extremely long stroke it seems to be amply long enough for proper fuel economy and for best power output at all loads.

The ignition should be by the Bosch dual system, which system should also be used to light the headlights. The lubrication should be by a combined splash and force-feed system, and it should be so designed as to positively force the oil to the cylinder walls and the bearings. Small scoops should be fitted to the crank ends of the connecting-rods to dip oil from the reservoir. The clutch should be a multiple disk one, with 61 plates running in oil. The housing for this should be so constructed as to prevent any leakage of oil.

The transmission should be of the selective type and there should be three speeds forward and a reverse. The drive should be by shaft, and there should be two universal joints included.

Semi-elliptic springs should be used on front and rear, and the rear axle should be floating. A B. & L. Castor front axle seems very desirable to me, as I have seen to my satisfaction that it reduces vibration and makes steering much easier, especially over rough roads. A wheelbase around 140 inches seems about the correct thing to me, as it allows ample seat room and leg room. Tires to carry should be 36 inches by $4\frac{1}{2}$ inches.

The control should be in the center of the car, since this makes for simple chassis construction, as well as making it easier for the driver to get into his seat. The steering wheel should be on the right, and it should have mounted on it the usual spark and throttle levers. The body should have ample seat room for five passengers.

I would specify the usual equipment of speedometer, lamps, horn (Klaxon), compressed air self-starter, two extra quick-detachable tires, robe rail, tire irons, waterproof top, windshield, gasoline gauge on dash, clock, trunk rack, etc.

Possibly the price of this car would run up to as high as \$5,000, but I think it would be worth the money.

K. L. S.

Washington, D. C.

Oxy-Acetylene Welding and Cutting

WHILE the oxy-acetylene flame, by reason of its manageability and intense heat, has proved exceedingly convenient for the performance of welding and metal-cutting operations, even such as a short time ago were beyond the resources of an ordinary machine shop or factory, an exaggerated idea of the simplicity of the equipment required for the production and utilization of this gas mixture has resulted in an influx upon the markets, in most industrial countries, of many troublesome apparatuses, which are usually offered at a tempting price, as sufficient for all needs. As an offset to this condition, some of the technical publications in Europe are now furnishing descriptions and explanations of good practice in this new branch of work, and, while the descriptions are perhaps in no instance completely up to date—since new developments appear from day to day—they illustrate the technical requirements of the work and enable the readers to steer clear of devices in whose design, materials and workmanship there is no evidence to show that the makers have investigated anything but the vogue of this class of apparatus.

Some extracts with illustrations from German articles of this kind are presented in the following, though it may be noted that the German writers agree on recognizing superiority in the British practice so far as the hand tools are concerned which are employed for the work.

WELDING—A welding tool which was first shown at the British Olympia exhibition one year ago and which has been found convenient and durable is represented in Fig. 1, including a sectional and a top view and two detail sections. The two inlet pipes, a for oxygen and b for acetylene, are connected with the gas generators or tanks. The oxygen passes through the control valve c and the tube d to the injector nozzle e, issuing from which it mixes with the fuel gas coming by way of the cock f and the tube g. The now united gases, whose quantities can be accurately regulated at c and f, are carried out into the expansion space h which extends from the bent mouthpiece i into the copper discharge nozzle k. By virtue of the oblique position of the mouthpiece, the tool can be placed in any angular relation to the work, from 0 to 70 degrees, without interruption of the flame. By loosening the knurled nut l, the mouthpiece can simply be turned around to the desired position. This is especially of value if the work cannot so readily be turned around.

Many universal welding tools, intended to be operated with different mouthpieces according to the requirements of the work, are offered in the market, but the frequent exchange of mouthpiece soon affects the screwthreading, and in some of them back-firing is liable to occur, the flame striking back into the mouthpiece and continuing to burn, so that the welding is interrupted and often spoiled, while the tool must be cooled before it can be used again. Even if an accurate adjustment of the oxygen supply is possible in a universal burner of the kind referred to, more skill is required as well as more time for making the adjustment correctly than if a special tool, intended for only one mouthpiece and a limited range of gas adjustment, is used. Considering the influence upon the work of unsuitable adjustment and the fact that the oxygen is the most expensive material used in the process, and that this material is wasted if the regulation of its feed is in any manner rendered difficult or inconvenient, it is not surprising that the best practice runs to the use of complete special tools for each kind of work which may be required in a shop. In this connection it is notable, too, that the different metals on which work is done naturally requires different quantities of gas for maintaining the heat required in each case over a given area of welding surface.

Among German advertisements are noticed some in which bottled and compressed oxygen is offered the trade for welding purposes, the bottles being either sold or rented, while on the other hand the acetylene gas is usually produced in generators which form part of the welding plants as they are offered for sale. These generators may be classified in four types, which, however, are of very unequal value in furthering and safeguarding the work for which they are intended. Only the system by which the calcium carbide is automatically fed in small quantities to a large volume of water can be considered as advantageous. The feed is adjustable, and the gas is generated only in small quantities corresponding to the demands of the work in hand. It therefore remains cool. The gas as fast as produced gathers under a floating bell. No after-development of gas takes place. The generator is always ready for new work without other preparation than the adjustment of the feed. In apparatus of this type the principal thing to look out for is that it includes no ropes, rollers, springs, valves, levers, cogwheels, stuffing boxes and rubber packings, but only water joints. The size of the carbide used should not be less than 10 millimeters (1-2 inch). Apparatuses with feed cocks and tubes or hose always

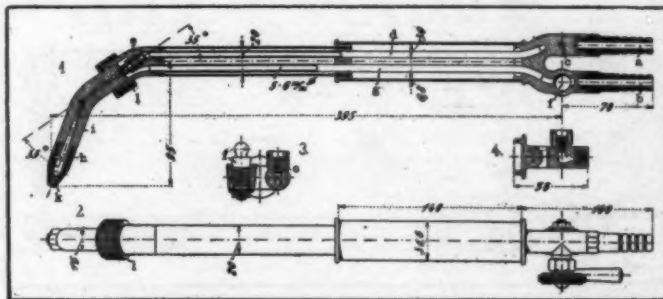


Fig. 1—Autogenous welding tool—dimensions in millimeters

require fine-grained carbide which remains in part dry on top of the water surface upon which it falls.

A variety of this type in which all the carbide required for the contemplated work is thrown into the water at once requires a large water reservoir to keep the gas cool and a large gas bell. It is lacking in compactness and calls for skilled judgment in estimating the carbide required, if interruption of the work is to be avoided.

The other systems represented in the market are the dipping system by which the carbide container is submerged in the water until a sufficient volume of gas has been generated and is then withdrawn; the expulsion system by which the water enters into two or more carbide containers from below and is expelled only by the gas pressure developed above it, and the combined dipping and expulsion system which combines the disadvantages of the two previous ones. These relate mainly to the after-development of a gas, which is generated under heat and is not acetylene (C_2H_2) but ethylene (C_2H_4) and has a harmful influence on the quality of the work, and to the necessity for frequent readjustments which interfere seriously with both quality and output. A disagreeable odor in the shop, from escaping gas, should also be mentioned. These methods all waste carbide through insufficient wetting.

With all systems, a simple method for getting rid of the carbide sludge should be provided. The simplest is a drain through which the sludge is washed out with the water.

CUTTING—A metal-cutting tool is shown in Fig. 2, including two sectional views of the tool in its entirety and three details.

The working principle is that the oxygen, entering under pressure at S entrains the fuel gas in the required quantity, so that a good mixture of both gases flows under sufficient pressure into the burner nozzle. The valve through which the oxygen is admitted can be regulated in two ways; first, by the knurled knob a which turns the valve spindle b, secondly, when this method is preferable, by first screwing the spindle b home in the threaded passage provided in the handlever c and then operating b up or down by means of this handlever, and by this method it is possible to shut the oxygen completely off by a single movement.

The details of the mechanism may be followed on the drawings. The valve spindle b is normally held open by a spring e secured in the bottom of the distribution chamber by a screw cap and bearing against a packing which acts upon a boss at the end of the spindle. The gas channels i and k, respectively for fuel and oxygen, are both provided with regulation cocks, l and m, the latter affording a different regulation for the oxygen from that which the spindle b places at disposal, as will be readily understood from the following. The fuel gas passes through k to the chamber p, while the oxygen, passing through the two openings regulated by spindles m and b respectively, flows into the separate channels s and t and thence to the end apertures of nozzles d and n. The channel t carries the oxygen intended for burning metal away and is discharged through the central nozzle d directly upon the work, while the oxygen flowing through channel t and serving to generate heat for melting the metal is first mixed with the fuel gas coming through the passages in the enveloping tube w, the mixing taking place in

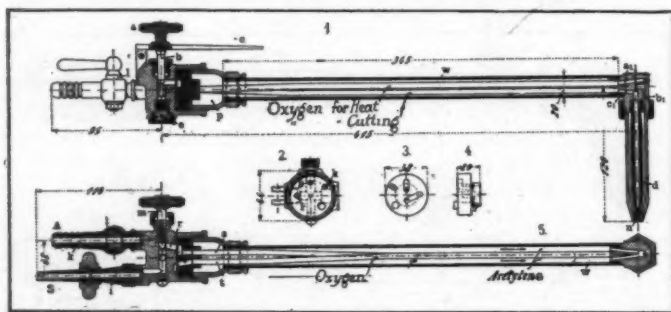


Fig. 2—Oxy-acetylene metal-cutting tool—dimensions in millimeters

the expansion space bt in the back part of the mouthpiece at and flowing from here into the annular space between the nozzles d and n. In the interior of the distribution chamber o, a connecting block is inserted which leads the gases from i and k in the manner explained, as shown more definitely in the small detail sections of Fig. 2.

The special advantages of this tool are the convenience and accuracy of the gas flow regulation and the ease with which the mechanism can be taken apart and again assembled.—From *Der Praktische Maschinen-Konstrukteur*, October 12.

Blackening Copper, Brass and Other Metals

With a pronounced tendency observable toward the avoidance of bright and shiny equipment for automobiles, the merits of various methods for imparting a black and permanent casting to the otherwise shiny parts naturally claim attention, and as it is a comparatively inexpensive process to copperplate most of the metals utilized for these parts the best means for blackening copper are considered in the first line. On this subject Bavarian Leaves of Industry and Trades (*Baye ische Industrie und Gewerbeblätter*), No. 43, offers information of a wet process with an alkaline solution which may be considered preferable to the well-known blackening process with nitrate of copper or nitric oxide and is more broadly applicable than the blue black etching process with an ammonia solution of copper which can be used only for alloys containing zinc.

The directions with regard to articles with a copper surface

are given as follows: A suitable quantity of a 5 per cent. lye of sodium carbonate (sal-soda) is heated to 100 degrees centigrade in a vessel of glass, porcelain, stoneware or enameled iron. Hereto is added 1 per cent. of powdered persulphate of potash, and the article is dipped in the bath suspended from a wire, so as not to touch the vessel. A visible generation of oxygen follows. The article is moved to and fro until the desired black color is obtained; in the case of small articles usually about five minutes. If the generation of oxygen is seen to lag or cease before this stage is reached, 1 per cent. of persulphate of potash must be again added. The velvety looking article is now rinsed in cold water and wiped dry with a soft cloth, acquiring a deep-black matt luster.

If the bath has not been exhausted and it is desired to use it again (with more persulphate of potash) it should be kept covered, so as to protect it against absorption of carbonic acid gas from the atmosphere.

Defective action, as may occur, may be due either to the lye or to the metallic surface. By continued use of the lye, the free alkali which is necessary for the action is neutralized by absorption of carbonic acid, or the alkaline bath is for other reasons deteriorated in course of time by generation and discharge of gas. In this case a new bath must be prepared.

Defects due to the condition of the metal surface are caused by thin films of oxide. It is best to prepare the metal by cleaning it in dilute sulphuric acid. Copper which has become tarnished by exposure or in a soldering process also accepts the etching process defectively. In contrast to the disturbing films of oxide, the brown coatings of protoxides obtained by the wet browning process accelerate the formation of black oxidation from the persulphate of potash bath, but the coatings formed on this foundation are somewhat less lustrous than those formed direct on metallic copper.

Zinc, tin, aluminum, iron, nickel, German silver, spelter and solder cannot be oxidized black by the persulphate of potash method, but some of the alloys of copper with these metals may be successfully treated. Those in which copper predominates, including the dark bronzes and gunmetal, accept the black coating like copper, but the process requires somewhat longer time, usually from five to ten minutes.

Brass and aluminum bronze require a bath in which the strength of the sodium carbonate bath has been raised from 5 per cent. to 10 per cent.

Pure or nearly pure aluminum is dissolved in the bath under a violent generation of oxygen.

Articles made of zinc may be blackened very successfully if previously copper-plated; but the copper coating must not be too thin, as a portion of it goes into solution in the bath. The electrolyte in which it is produced may, on the other hand, be either acid or basic. Copper articles in which there are seams of solder should also be plated first, as the solder will not accept the etching. And the plating is also the simplest method for removing the films of oxide which are usually formed on a soldered article and which would otherwise interfere with the blackening. To copper by dipping is not recommended, as the coat so formed is too thin and is usually also marred by spots of oxide which spoil the uniformity of the black coat.—From *Metall-Technik*, October 14.

FIRM, CLEAN ALUMINUM CASTINGS.—To get rid of the oxides which form on top of molten aluminum and get into the interior of the castings poured from it, the modern foundry man keeps a well stoppered bottle with chloride of zinc in pieces of about the size of a walnut, and when the aluminum reaches the fusion point, he picks out a piece with a tong—as the material attacks the skin—drops it into the molten mass and stirs the latter vigorously. Considerable smoke is developed by this process, but the bath becomes clean and mirror-like as molten tin, while the chloride gets black and floats to the edges of the crucible and the oxide turns into a powder which is simply brushed off before pouring.—From *Metall-Technik*, Oct. 28.

Waterproof Materials

In these modern days when serviceable substitutes for leather, varnishes and rubber are being sought by inventors, largely in connection with the production of articles intended for use in or with automobiles, the extensive application which has been found for casein is of interest. Mixed with soap and oils this substance is now much used for the sizing of textile goods. Four parts of casein with 30 parts of water and 1 part of chalk, mixed in a soap solution, make such a sizing, and if the fabric is subsequently plunged into a solution of acetate of aluminum, the casein is thereby rendered insoluble and the material can be washed in water and dried. The readiness with which the insolubility of the casein can be effected in any desired degree either by oxidation or by the action of formaldehyde is taken advantage of for producing materials which are to be permanently impermeable to water while admitting the passage of air.

Calicos and other materials which have always been prepared with albumen, derived from blood, to protect their colorings, are now in some cases treated with casein, which has proved cheaper, cleaner and better, and it is probably only a question of time before similar methods will be used for impregnating other fibrous material which should resist weather and water.—From *L'Industrie Textile*, August 15.

Production of Coal Tar

An inkling as to how far the actual production of coal tar will go in the improvement of roads may be had from British statistics on the subject. In 1889 there was an overproduction of the tar, and it was contemplated to turn it to use as fuel. Since then the tendency has been to reduce the tar production at the gas works, while the steel mills turn it out in ever increasing degree. The coal output of Great Britain rose to 263,774,000 tons in 1908. Out of this total 1,500,000 tons were used at the gas works. The total tar production was at the same time 1,100,000 tons, of which 750,000 tons came from the gas works, 150,000 tons from the coke ovens and 200,000 tons from the steel mills.—From *Bulletin of the Chemical Society*, II, 1911.

LUMINOUS PAINT.—By mixing pulverized phosphorescent material, such as sulfide of calcium, phosphoretted zinc or sulfide of barium, together with a trace of bismuth, with a binder material such as gelatine, lac, gelose, etc., a paint or gouache (water color body) is obtained which may be used for rendering any part of an automobile luminous in the dark, provided it has been exposed to the rays of light or heat previously. It may be varnished over or not, and it is not affected by rain or weather. The color may be any one desired. Georges Garfoukel has the French patent.—From *Chimie Industrielle*, September.

Calendar of Coming Events

Shows

Dec. 30-Jan. 6.....Buffalo, N. Y., Annual Show, Seventy-fourth Regiment Armory, Buffalo Automobile Trade Association.
 Jan. 2-11.....New York City, Hotel Astor, Importers' Salon.
 Jan. 6-13.....New York City, Madison Square Garden, Twelfth Annual Show, Pleasure Car Division, Automobile Board of Trade.
 Jan. 6-20.....New York City, Madison Square Garden, Annual Show, Motor and Accessory Manufacturers.
 Jan. 10-17.....New York City, Grand Central Palace, Twelfth Annual Show, National Association of Automobile Manufacturers; also Motor and Accessory Manufacturers.
 Jan. 13-19.....Milwaukee, Wis., Auditorium, Fourth Annual Show, Milwaukee Automobile Dealers' Association.
 Jan. 13-27.....Philadelphia, Annual Show, First and Third Regiment Armories, Philadelphia Automobile Trade Association.
 Jan. 15-20.....New York City, Madison Square Garden, Twelfth Annual Show, Commercial Division, Automobile Board of Trade.
 Jan. 15-20.....Toledo, O., Annual Show, Terminal Building, Toledo Automobile Dealers' Association.
 Jan. 22-27.....Rochester, N. Y., Annual Show, State Armory, Rochester Automobile Dealers' Association.
 Jan. 22-27.....Detroit, Mich., Wayne Gardens, Eleventh Annual Show, Detroit Automobile Dealers' Association.
 Jan. 22-27.....Providence, R. I., Providence State Armory, Rhode Island Licensed Automobile Dealers' Association, Automobile and Accessories Show.
 Jan. 22-27.....Dubuque, Iowa, Annual Show Dubuque Automobile Dealers' Association.
 Jan. 27-Feb. 10....Chicago Coliseum, Eleventh Annual Automobile Show under the auspices of the National Association of Automobile Manufacturers. Pleasure cars, first week. Commercial vehicles, second week.
 Jan. 27-Feb. 10....Pittsburgh, Pa., Sixth Annual Show, Automobile Dealers' Association of Pittsburgh, Inc. Pleasure cars, first week. Commercial vehicles, second week.
 Jan. 29-Feb. 3.....Scranton, Pa., 13th Regiment Armory, Second Annual Show.
 Feb. 1-7.....Washington, D. C., Annual Show, Convention Hall.
 Feb. 3-10.....Montreal, Canada, National Show, Drill Hall, Automobile Club of Canada.
 Feb. 3-10.....Harrisburg, Pa., Third Annual Show, Arena.
 Feb. 5-10.....Buffalo, N. Y., Convention Hall, George C. Fehrman.
 Feb. 5-17.....St. Louis, Mo., Coliseum, Annual Show, Pleasure cars, first week. Commercial vehicles, second week.
 Feb. 10-17.....Atlanta, Ga., Auditorium-Armory, Atlanta Automobile and Accessory Dealers' Association.
 Feb. 12-17.....Ottawa, Ont., Howick Hall, Annual Show, Ottawa Valley Motor Car Association.
 Feb. 12-17.....Kansas City, Mo., Annual Show, Combined Association of Motor Car Dealers.
 Feb. 12-17.....Troy, N. Y., Second Annual Show, State Armory, Troy Automobile Dealers.

Feb. 12-19.....Dayton, O., Third Annual Show, Dayton Automobile Club.
 Feb. 14-17.....Grand Rapids, Mich., Third Annual Show.
 Feb. 17-24.....Pittsburgh, Pa., Second Annual Show, Exposition bldg., Pittsburgh Auto Show Association, Inc.
 Feb. 17-24.....Newark, N. J., Fifth Annual Automobile Show, New Jersey Automobile Exhibition Company, First Regiment Armory.
 Feb. 17-24.....Minneapolis, Minn., National Guard Armory and Coliseum, Annual Automobile Show, Minneapolis Automobile Show Association.
 Feb. 19-24.....Omaha, Neb., Seventh Annual Show, Auditorium, Omaha Automobile Show Association.
 Feb. 19-24.....Hartford, Conn., Annual Show, Automobile Club of Hartford, State Armory.
 Feb. 19-24.....Cincinnati, O., Annual Show, Music Hall, Cincinnati Automobile Dealers' Association.
 Feb. 20-24.....Binghamton, N. Y., State Armory, Third Annual Show, Automobile Dealers' Association.
 Feb. 20-28.....Baltimore, Md., Annual Show, Baltimore Automobile Dealers' Association.
 Feb. 21-24.....Louisville, Ky., Fifth Annual Show, First Regiment Armory, Louisville Automobile Dealers' Association.
 Feb. 21-28.....Toronto, Ont., Annual Show, The Armouries, Toronto Automobile Trade Association.
 Feb. 24-March 2...Brooklyn, N. Y., Twenty-third Regiment Armory, Annual Show, Brooklyn Motor Vehicle Dealers' Association.
 Feb. 26-Mar. 2....Elmira, N. Y., Second Annual Show, Elmira Automobile Club.
 Feb. 26-Mar. 2....Paterson, N. J., Annual Show, Fifth Regt. Armory, Paterson Automobile Trade Association.
 Feb. 26-Mar. 3....Quincy, Ill., Highland Park Stone Pavilion, Annual Mississippi Valley Show, Quincy Auto Club.
 Feb. 28-Mar. 2....Davenport, Iowa, Annual Show, Davenport Automobile Association.
 March 2-9.....Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc.
 March 4-9.....Denver, Col., Auditorium, Annual Show.
 March 4-9.....Denver, Col., Annual Show, Auditorium, Motor Field.
 March 6-9.....Tiffin, O., Second Annual Show, The Advertiser.
 March 12-16.....Syracuse, N. Y., Fourth Annual Show, State Armory, Syracuse Automobile Dealers' Association.

Meetings, Etc.

Jan. 8.....New York City, Waldorf-Astoria, Annual Meeting of the Motor and Accessory Manufacturers, Inc.
 Jan. 18-19.....New York City, Madison Square Garden, Annual Meeting Society Automobile Engineers.

Race Meets, Hill-Climbs, Etc.

Dec. 25-26.....Los Angeles, Cal., Track Races, Motordome.

THE AUTOMOBILE

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THE CLASS JOURNAL COMPANY

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The Get-Together Spirit

WITH the return of Christmas and New Year's the mind naturally turns to review the affairs of the year, the progress of the seasons, the forces that have been the molding influences, the factors that have been for good or ill during the previous twelve-month. The year just drawing to a close has been fraught with much of interest insofar as the automobile is concerned; it has shown more unity of purpose among the makers than has ever been evidenced before and it has been a year of real progress. There has been in evidence more of a spirit of get-together than ever before. The engineers set the ball rolling in this co-operation scheme through the excellent work of the Society of Automobile Engineers. The midsummer convention and the recent trip abroad have both proven the value of a good interchange of ideas; both have taught the members that strength is in unity and not in isolation. The days when the engineer wanted to play the rôle of the Pharisee are over. This society has been the means of bringing to light some of the profoundest secrets of the industry. Only a year or so ago many engineers refused to even discuss many of their ideas with their intimate friends. They seemed to imagine that they possessed the only solution of the motor, the ignition, the carbureter or the self-starting problem and that if they opened their mouths the magic would depart from them. This old rule is passing away. The new wine is too strong for the old bottles and the rising engineers are men not afraid to meet face to face with others and give their opinions of present tendencies and trends.

What the engineers are doing the sales managers could do to great advantage. If there is any department of the industry in which new ideas and new blood are needed it is in the sales departments. The fossils have one by one been dropping off for the last 18 months, but the trouble is to get new blood to take their places. New salesmen are needed in every city—salesmen who have

address, who have knowledge, who are students of psychology and who have ability. It would be a good investment if all of the factories would appoint their sales managers delegates to a convention in which the fine art of salesmanship would be discussed from every angle. Education of the masses is the big need. There are a few who know, but for each one who knows there is a score who do not know. Conventions of this nature would be a great investment to the industry—an investment that would pay twenty, thirty or fifty-fold. Some say that such a convention would be impossible; that the head salesmen could not be brought together; that if they should convene those who know would refuse to give away their knowledge to those who do not know, and that the entire scheme would be a failure. Many talked in this strain before the Society of Automobile Engineers attained its present standing. The facts have proven otherwise, and although many of the engineers refused to discuss matters at the start and although many still refuse to enter into such discussions, still there has been much good come of the discussions that have taken place; due to the general freedom of speech and expression that has been developed since the society began its work. What has happened with the engineers would happen with the salesmen. That is the one big reason why such a convention should be encouraged.

Among others prominent in the industry who should get together are the automobile dealers in the big cities and towns in the different parts of the country. The dealers are the least prosperous class connected with the industry. Many of them are poor because they worked to make themselves so. They should not be disappointed when the harvest reaped is the natural result of their actions. Many, yea, scores and even hundreds, have bitten on the second-hand car proposition. Not a few have tied up all of their profits in the used cars they have taken in part payment for new ones, and at the close of the season they find themselves unable to make the necessary deposits on 1912 cars. Scores of the dealers imagined that they had to keep cars moving off the salesroom floor. One was frank enough to say that his actual profit on the sale of a new car was \$2.70. This is not much of a margin on which to pay rent, pay sales, office and garage employees, pay insurance and a hundred other expenses in conjunction with a salesroom, and live and lay aside something for the future.

The dealers should make money. They are the people who are closest to the buying public. They are the thermometer by which the public gauges the standing of the industry. If the dealers are poor, the business men will naturally estimate the industry accordingly. Dealers should get together and better their lot. If the factory is not giving them a fair show, then the best way to get justice is to get together and demand those rights which are rational and just. The dealers will get more if they band together than if they act single-handed. Only a few weeks ago a great many of the Secretaries of States from scores of states throughout the country met to study the best laws for the control of automobiles. They talked the laws over. The pros and cons were well discussed. The man from New York learned from the man from Illinois, and the Oklahoma delegate got many points of information from the Connecticut delegate. All went home filled with ideas. The man who gave to others his good ideas was perhaps happier than he who went home

loaded to the guards with facts. What can be done for legislation can be done for the dealers. A big dealers' convention should be called in Chicago. It is the most central point. A national organization, for the purpose of controlling such conventions, should be planned. A good sensible program should be arranged, and each dealer attending would find himself amply repaid for the time and money expended.

"Know your business better" is the slogan of the motor car business. One dealer acknowledged a week ago that he never knew exactly what departments of his business were making money and what departments were being

operated at a loss. He put on an accountant. He was amazed at the results. Departments that he imagined to be self-sustaining were draining the more fruitful ones. Once he knew where he stood it was possible to make investigation into the causes of the loss and prescribe remedies.

Every dealer should look to this department of his work. He should systematize more. With increasing competition more efficient management of branches and salesrooms is imperative. It will require more brains to make money as a dealer during the coming year than it did last year. Real effort is needed.

S. A. E. Shows Remarkable Growth

THE Society of Automobile Engineers will close the year with nearly 1,200 members. Applications for membership are coming in at the rate of 100 a month.

The annual meeting of the society will be held in New York, January 18-20. This is during the week of the commercial vehicle division of the automobile show at Madison Square Garden. The sessions of the society will take place in the assembly hall of Madison Square Garden. The program follows:

Disintegration of Fuel Particles and Homogeneous Carbureting of Air, by Forrest A. Heath.

Standardization of Drawings, by George W. Dunham.

Compound Gas Engines and Their Efficiency, by Eugene P. Batzell.

Present Status of Automobile Lighting, Gas and Electric, by J. W. Esterline and A. E. Berden.

Position of Brakes; Double-rear-wheel versus Propeller-shaft; Front-wheel Brakes, by S. I. Fekete.

Definitions in Connection with Physical Properties of Steel, by Henry Hess.

Mechanical Points in Connection with the Construction of Solid Motor Tires, by Charles B. Whittelsey.

Silent Chains, by Chester S. Ricker.

Automatic Spark Advance, by Lon R. Smith.

Underslung Frames, by S. I. Fekete.

Balance of Motors, by Ernest R. Fried.

Self Starters for Gasoline Motors, by J. W. Fitzgerald.

Multiple Disc Clutches, by Joseph A. Anglada.

The following divisions of the now famous Standards Committee will have reports to present:

Ball and Roller Bearings, David Fergusson, chairman.

Broaches Division, C. E. Davis, chairman.

Carburetor's Division, G. G. Behn, chairman.

Frame Sections Division, J. G. Perrin, chairman.

Iron and Steel Division, Henry Souther, chairman.

Miscellaneous Division, A. L. Riker, chairman.

Subjects in connection with report of miscellaneous division:

Standard Gauge Tread for Pleasure and Commercial Vehicles, Electric Lighting Outfits, Magneto Dimensions, Spark Plug Thread Tolerance, Vehicle Taxation Formula, Metal Gauges, Oversize Standards for Pistons, Bushed Yoke and Eye Rod Ends, Limits for S. A. E. Screw Threads.

Nomenclature Division, H. E. Coffin, chairman.

Seamless Steel Tubes Division, H. W. Alden, chairman.

Springs Division, A. C. Bergmann, chairman.

Truck Standards, W. P. Kennedy, chairman.

Advantages and Disadvantages of Large Driving Wheels; Increasing the Utility of Commercial Cars by Auxiliary Loading and Unloading Devices, by E. W. Curtis, Jr.

General Problem of City Freight Transportation.

Several hundred members are expected from all over the United States. Henry Souther, president of the society, will

preside over the deliberations. The annual election of officers will be held during the session. A feature of the meeting will be an account of the first European visit of the society. The subject will be introduced generally by Henry F. Donaldson. Then several points of live technical interest will be taken up. Wire wheels for motor cars will be discussed and the results of some new comparative tests of crushing and dishing strength of hickory and wire wheels will be submitted. C. B. Hayes and Bert Morley will take part in the discussion of this subject. The subject of silent chains for accessory motor drives and for gear boxes will be taken up. The worm gear drive will be discussed by David Fergusson, E. R. Whitney, C. E. Davis and W. C. Baker. Sleeve-valve motors will also be treated at considerable length, H. E. Coffin, Henry Souther and J. B. Hull entering into the discussion. Minor points and peculiarities of European motor-car design and construction will be pointed out and analyzed. A group of the American automobile engineers visiting Europe was the commercial vehicle division.

Death of Georges Dupuy

The death of Georges Dupuy is announced in *L'Auto* of December 13. Dupuy was widely known to members of the American automobile industry, having worked for several years as a writer for various automobile journals in this country, while later he returned again to inspect and describe American factories for *La Vie Automobile*, *L'Auto* and other French journals. He was the master of a very vivacious style, especially in French, and embraced all sports as well as philosophical economics in his repertoire. He was sent by *Le Figaro* to Reno to report the Jeffries-Johnson fight, and his description of this encounter was considered an exceptional piece of work.

H. W. Whipple Suddenly Stricken

BOSTON, Dec. 26—Harlan W. Whipple, one of the early presidents of the American Automobile Association, died suddenly last night of heart trouble while visiting at the home of Col. Smith M. Decker, at Lawrence. The latter's home is near that of Mr. Whipple. Mr. Whipple was just preparing to go home when he was stricken.

In the early days of motoring Mr. Whipple became a devotee of the sport. He gained prominence and was elected President of the American Automobile Association in 1904. That same year he led the contestants in the famous run to the St. Louis exposition, driving car No. 1. In 1905 he was re-elected President of the A. A. A.

He was born at South Dartmouth, Mass., Oct. 8, 1865, graduated from Phillips, Andover and Williams College, then entered business first in Chicago, next in San Francisco and finally at New York.

Planning Ocean-to-Ocean Highway

PHOENIX, ARIZ., Dec. 26—Eighty-four delegates from Arizona, California and New Mexico met in the State Capitol at Phoenix, December 20 and 21, and formed the Ocean-to-Ocean Highway Association. The main object of the association is to work for the construction of a transcontinental automobile highway passing through the three states represented.

It was left to the three delegates to decide upon the route to be taken by the highway in each state. Arizona and New Mexico had no trouble in reaching an agreement, but eleven California delegates withdrew from the organization when the convention refused to receive their minority report.

Governor Richard E. Sloan of Arizona issued the call under which the convention was held. He called the delegates to order at 10 o'clock Wednesday morning and the business in hand was transacted with astonishing rapidity. The following officers were elected: President, John S. Mitchell, Los Angeles; secretary, J. S. Conwell, Los Angeles; treasurer, A. W. Ballard, Phoenix; vice president for California, A. G. Spalding, San Diego; vice president for Arizona, Del M. Potter, Clifton; vice president for New Mexico, D. B. Sellers, Albuquerque. The legislative committee chosen consists of Stoddard Jess, Los Angeles; Thomas Early, Pasadena; F. A. Miller, Riverside; A. W. Balfour, Pomona; Rufus Choate, San Diego. All the members of this committee are Californians.

One of the first acts of the convention, after President Mitchell took the chair, was to unanimously select Santa Fe, New Mexico, as the place for the second annual convention, to be held the third week in October, 1912.

When the convention adjourned in the afternoon it was with the understanding that the three delegations should caucus and endeavor to agree upon the route through each state which they wished the national highway to take. It had already become apparent, however, that the California delegation was hopelessly split. The eight delegates from San Diego and three from the southern part of the Imperial Valley were in the minority. Knowing themselves outnumbered, they refused to caucus with the majority.

Next morning the California majority, the New Mexico and Arizona delegations presented their reports, which were approved by the convention as read.

The New Mexico route recommended in the report starts at the Arizona line sixteen miles east of Springerville and proceeds eastward to Magdalena, Socorro, San Antonio, Carthage and Albuquerque; thence to Santa Fe, Las Vegas and Raton, leaving the state on the old Santa Fe trail twelve miles north of Raton on the Colorado state line.

Following is the Arizona report: "Resolved, That the transcontinental highway, in crossing the state of Arizona, shall begin at Yuma on the Colorado River and run thence along the course of the state highway as heretofore surveyed to the city of Phoenix, thence by way of Tempe and Mesa to the Roosevelt dam, thence to the city of Globe over the state highway already constructed, thence to San Carlos on the Gila River, thence up the Gila Valley to Clifton, thence northerly to Springerville, thence easterly to the Arizona and New Mexico line to form a junction with the highway as constructed through the state of New Mexico."

The California majority report follows: "Whereas, the California delegation of the Ocean-to-Ocean Highway Association, in caucus assembled, believing that the route presenting the fewest geographical and physical obstacles should be endorsed for the national highway, having under consideration the advantages of having such a highway pass through as much set-

tled territory as possible, and within striking distance at all times of a transcontinental railroad, therefore be it

"Resolved, That the California delegation recommend as a course for the national highway a route running westerly from Yuma, along and near the Southern Pacific railway to a point about 4 1-2 miles west of Mammoth station, thence southwesterly to Brawley, thence northwesterly along the south and west side of Salton Sea to Mecca, thence along the main line of the Southern Pacific railroad to Beaumont, Redlands Junction, Colton, thence by shortest road to Los Angeles."

San Diego endeavored to present a minority report recommending that the route in California start at Yuma and proceed through the southern part of the Imperial Valley, El Centro and Holtville, on to San Diego. As the San Diegoans had refused to caucus, the minority report was not received. Thereupon the San Diegans announced that they would withdraw from the organization. A. G. Spalding, vice president for California, and Rufus Choate, member of the legislative committee, would not serve, they said.

It is not the intention of the association to immediately ask for federal aid in building the transcontinental road through Arizona, New Mexico and California.

Rough drafts of articles of association and by-laws for the organization were drawn by a committee appointed for that purpose and approved by the convention. To Mr. Norris was entrusted the work of whipping them into legal form. The rough draft sets forth the object of the Association as follows:

"First: That establishment of a system of national highways which shall traverse the states of California, Arizona and New Mexico and such other states as may choose to affiliate themselves with and become a part of this organization.

"Second: For the establishment of a uniform system of road building, which system of road building shall be uniform and meet at given and common points to be established by the states of California, Arizona and New Mexico, said points to be established by the several states.

"Third: To obtain federal aid and co-operation toward the establishment of a system of interstate roads between the states of California, Arizona and New Mexico and such other states as may affiliate themselves with this organization.

"Fourth: To obtain the co-operation of all states in the Union for the purpose of obtaining federal aid toward the establishment of a series of national highways traversing the United States of America and to that end we earnestly request the co-operation of all states in the Union and assure them of our hearty co-operation in bringing about said highway to promote the objects of this organization."

On Wednesday evening the delegates to the convention were entertained at a banquet by the City Club of Phoenix.

Pennsylvania Surveys Roads

YORK, Dec. 26.—Engineers of the Pennsylvania state highways department have completed the surveying of sixty-five of the routes for main highways carried by the Sproul main highway act of 1911, according to a report just made to Highway Commissioner E. M. Bigelow, by Samuel D. Foster, chief engineer of the department. Included in these sixty-five routes are 2,755 miles, all of which have been surveyed, and of this length 621 miles has been plotted.

All these dirt roads will be taken by the state June 1 next and maintained by the state highway department. The toll roads will not be surveyed until they have been taken over by the

state, as they will have to be purchased from the various companies owning them.

The routes surveyed include the following: Sunbury to Danville, Bloomsburg to Wilkes-Barre, Scranton to Montrose, Bloomsburg to Laporte, Sunbury to Williamsport, Wellsboro to New York state line, Lewisburg to Sunbury, Harrisburg to Carlisle, Carlisle to Chambersburg, Chambersburg to Maryland line, Gettysburg to Maryland line, Bedford to Hollidaysburg, Ebensburg to Hollidaysburg, Huntingdon to Hollidaysburg, Clarion to Franklin.

Pittsburgh to Butler, Butler to Mercer, Mercer to Ohio line, Mercer to Meadville, Meadville to Franklin, Meadville to Erie, Erie to Warren, Warren to Smethport, Smethport to New York line, Ridgway to Emporium, Coudersport to Wellsboro, Washington to Waynesburg, Waynesburg to West Virginia line (2), Uniontown to Washington, Washington to West Virginia line, Washington to Beaver.

Gettysburg to York, Philadelphia to Media, Philadelphia to Maryland state line, West Chester to Delaware state line, York to Harrisburg, Philadelphia to Doylestown, Doylestown to Easton, Philadelphia to Delaware line, West Chester to Maryland line, Harrisburg to Lancaster, Lancaster to Maryland line, Harrisburg to Gettysburg, Wellsboro to Towanda, Hollidaysburg to Clearfield, Bedford to Ebensburg, Tunkhannock to New York line, Washington to Greensburg, Coudersport to New York line, Pittsburgh to New Castle, Franklin to Mercer, Warren to Mercer, New Castle to Meadville, Reading to Allentown, Allentown to Easton and Allentown to Mauch Chunk.

Maryland Chief Asks Change in Law

BALTIMORE, MD., Dec. 26—Governor Austin L. Crothers, the retiring chief executive of Maryland, in his message to the

Legislature, recommends that the office of Motor Vehicle Commissioner be abolished by the state and that the enforcement of the law be placed in the hands of the state roads commission. In discussing the motor vehicle law and the changes he suggests, Governor Crothers said:

"This law, passed by the last legislature for securing state revenue from the use of motor cars and to regulate and make safer their travel upon the public roads, has been a success. The revenue collected by this department in licenses issued has amounted to \$103,000. I believe in 5 years this will reach \$300,000, which will go to the maintenance and building of state roads.

"The motor car is here to stay. Could we not manufacture them to a greater extent within our own state and keep the money at home?"

Wisconsin to Build 645 Miles of Road

MADISON, WIS., Dec. 26—The Wisconsin Highway Commission, created by an act of the last legislature appropriating \$350,000 annually for an indefinite period of years for state aid for highway construction, has just announced that \$1,250,000 will be expended in this state during 1912 for highway improvement as the result of the granting of state aid.

This total has surprised even the most enthusiastic supporters of state aid and proves that the state aid law is being received in a most gratifying manner. The details of the expenditures reported by the commission are as follows: Stone roads, 220 miles; gravel roads, 150 miles; shale road, 25 miles; dirt road, 250 miles, a total of 645 miles. In addition there will be constructed under this act 140 bridges to cost \$150,000 and divided among 123 townships. Never before in the history of Wisconsin has there been so great a proposed expenditure for highway work.

Entries for the French Grand Prix

UNDER date of December 9 there had been entered for the Grand Prix and Coupe de l'Auto races—to take place jointly in June, 1912, if 30 entries are booked before December 30, 6 o'clock evening—the following cars: 4 Lorraine Dietrich, 4 Gregoire, 4 Lion-Peugeot, 2 Peugeot and 4 Darracq. The following were mentioned as sure to be booked immediately the nominations having been forwarded: 4 Sizaire-Naudin, 3 Alcyon and of English cars 3 Calthorpe and 3 Sunbeam. "This is without counting those which we shall soon name," adds Charles Faroux, the editor of *La Vie Automobile* and original organizer of the Coupe de l'Auto, writing in *L'Auto*, the daily automobile and sporting journal of Paris. This journal is also in receipt of a communication from the Mathis firm of Alsace-Lorraine announcing that this manufacturer has refused to join the German boycott of the two races, and in another paragraph it is intimated that the real reason for the unfriendly action of the other German firms is to be sought in the fact that one of the foremost among them recently lost its chief engineer, who emigrated to a neighboring country, taking with him all his assistant designers, and the firm, finding itself unable to compete with much hope of winning, engineered a general German boycott to save its own prestige.

Quakers Ask for Fairmount Date

PHILADELPHIA, Dec. 26—Notwithstanding the fact that Dr. J. William White, a member of the Fairmount Park Commission, has taken preliminary steps to halt the running of the Fairmount Park road race, and that the holding of the 1911 event created a deficit in the organization's treasury, application for sanction has been made and a date has been assigned to the Quaker City

Motor Club by the American Automobile Association for the 1912 race for Saturday, October 5.

In addition to the admission of about 30 new members at a meeting held this week in the clubrooms, Hotel Walton, plans were made for an active winter, a feature of which will be a series of lectures on automobile topics—engines, tires, radiators, etc. The first of these talks will be given in the middle of January, when Charles Y. Knight, the inventor of the engine bearing his name, will deliver a lecture on engines.

Race Promoters Ask for Big Dates

Applications for racing dates covering six of the great automobile road racing and speedway features for 1912 have been filed with the Contest Board of the A. A. A. The Elgin national stock car races will be held August 30-31, according to the request on file. This will almost certainly be granted by the board.

The Quaker City Motor Club has also applied for the date of October 5 for holding the annual Fairmount Park road race and it is understood that there will be no trouble in securing that date for the event. At Bakersfield, Cal., a road race will be held, probably February 22, and such reservation is expected to be made this week upon receipt of formal application.

The Indianapolis Speedway has applied as usual for race dates on Memorial, Independence and Labor days. The latter date, the first Monday in September, comes pretty close to the tentative dates for the Elgin stock car meeting and some sort of an adjustment is expected to do away with the difficulty.

Los Angeles automobilists have inquired of the A. A. A. whether a sanction will be required for the race meet now planned as a benefit for Hanshue, injured during the desert race.

News of the Week Condensed



Fleet of Commer trucks now in use by H. L. Herbert & Company, coal dealers, of New York City

NEW YORK CITY—The firm of H. L. Herbert & Company is one of the numerous coal-dealing concerns which are changing from the old system of delivery with horses to the motor truck system. The company has a fleet of eight Commer trucks in service and is finding the new way much cheaper and more efficient than the old.

DENVER, COL.—J. C. Fry, J. W. Ebert and R. M. Robertson have joined the sales force of the local branch of the Metzger Motor Car Company.

SYRACUSE, N. Y.—The Hupmobile agency here has been taken over by Frank P. Anderson, who handles the Alco in this territory. C. H. Marshall was formerly the Hupmobile agent.

ATLANTA, GA.—The Atlanta Automobile and Accessory Dealers' Association will hold an automobile show in the Auditorium-Armory from February 10 to 17. Homer C. George is manager.

FLINT, MICH.—F. W. A. Vesper has resigned his position as manager of the Texas Buick Company of Dallas, Tex., to become assistant general sales manager of the Buick Motor Company of this city.

DENVER, COL.—The R. C. Hupp Company has appointed the following agents in this territory: Browning Bros., Ogden, Utah; R. C. Tarrant, Sheridan, Wyo.; P. W. Pitman, Las Animas, Col., and Ideal Motor Company, Pueblo, Col.

SYRACUSE, N. Y.—A new automobile company is shortly to be incorporated in this city to be known as the E. B. Sabine Company. The Bissell garage will be the

temporary home of the company, which will handle the Cutting car.

CHICAGO, ILL.—The American Electric Company, State street, Chicago, has opened a permanent downtown sales and show room at 1254 Michigan Boulevard in the New Southern Hotel building. This has been designated the Samson Horn Store.

NEW YORK CITY.—The Philadelphia Storage Battery Company has opened a new New York office in the American building, Broadway and Columbus Circle, in order to facilitate the handling of its increasing business in electric vehicle batteries and other types of batteries used in the automobile trade.

ATLANTA, GA.—A state association of automobilists will be formed at a meeting which will be held in Atlanta, January 2. G. W. Hanson, chairman of the meeting and the originator of the scheme, appointed Walter P. Andrews as chairman of a committee to draw up a constitution and by-laws. The clubs of Savannah, Macon, Augusta, Griffin, Americus, Albany and Rome will affiliate with the state body.

DENVER, COL.—The Overland Auto Company, Western distributor for the Willys-Overland Company, has appointed the following agents in their territory: Canyon City Auto Company, Canyon City, Col.; Paul Auto Company, Colorado Springs, Col.; Tyler Auto Company, Pueblo, Col.; R. K. Young, Salida, Col.; W. Whalen, East Las Vegas, N. Mex.; Monte Vista Motor Car Company, Monte Vista, Col.; F. W. Roedel, Cheyenne, Wyo.; J. H. Walker & Son, Santa Fé, N. Mex., and Forest Lumber Company, Fort Collins, Col.

DETROIT, MICH.—The new Miller carbureter, which is now manufactured in Los Angeles, Cal., will now be manufactured in the east as soon as the factory is completed in this city. The company has secured E. J. Edmond, of 1783 Broadway, New York City, to handle the carbureter in the Eastern states.

ANDERSON, IND.—William O. Kennington, of London, England, has accepted the position of assistant chief engineer with the Remy Electric Company of this city. Mr. Kennington, while a young man, has had a long experience in the electrical engineering profession.

EVANSVILLE, IND.—The Columbia Taxicab Company has been organized here to conduct a taxicab and baggage delivery service. The company has been incorporated with an authorized capitalization of \$10,000, the principal stockholders and directors being E. C. Kinkle, Walter Wheeler, A. C. Mathias and H. E. Hulsmann.

FINDLAY, O.—The Main Garage, on North Main street, has been sold by its owner, Earl Myers, to George Koogle. The business was established several years ago.

DES MOINES, IA.—Twenty-five Overland agents from Central met in Des Moines Monday as the guests of the Riddell Auto Company, local agent for the company. T. C. Whitcomb, sales manager, was present.

Owosso, MICH.—A deal has been closed by which E. A. Eddy, Sr., and his son, both of Bay City, become owners of the equipment of the defunct Owosso Motor Company. They expect to manufacture the car in Bay City. The Owosso company was made up of local business men.

DENVER, COL.—The Boss Rubber Company has added the Kelly-Springfield tire to its line.

COLUMBUS, O.—The contract has been awarded for a large garage at Sixth and Kaiser streets for the George W. Bobb Company.

KANSAS CITY, Mo.—The Truffault-Hartford Company has opened a branch in this city at 1524 Grand avenue. Henry Romer is in charge.

CLEVELAND, O.—The Brooks - Norton Motor Sales Company, of 1927 Euclid avenue, has taken the agency for the Ohio electric and the Modern truck.

SPRINGFIELD, O.—The Springfield Tire & Rubber Company has increased its capital from \$50,000 to \$150,000 and will make additions to its factory next year.

ATLANTA, GA.—The Premier Motor Manufacturing Company will open a southern service department in Atlanta about January 15. J. E. Levi will be in charge.

PHILADELPHIA.—W. R. Darrah, E. G. Brown and Robert Yerger have recently become affiliated with the Paxton-Crumley Auto Company, of 660 North Broad street.

COLUMBUS, O.—E. H. Wilson and J. C. Langley, proprietors of the Enterprise Garage at 241 West Fourth avenue, have taken the central Ohio agency for the Star starter.

LOUISVILLE, KY.—The Automobile Club of Louisville has got out a club paper entitled *Toots*. E. J. Strauss is managing editor and Colonel W. B. Haldeman is editor.

MANCHESTER, N. H.—The C. R. Sawyer Company, of this city, has closed with the Velie Boston branch for the sale of Velie pleasure cars and trucks in this section of New Hampshire.

PHILADELPHIA—H. A. Jenks has joined the sales force of the Philadelphia Loco-

mobile Company. Mr. Jenks was formerly connected with the Philadelphia branch of the Stoddard-Dayton.

ATLANTA, GA.—Henry Nyberg, of the Nyberg Automobile works, of Anderson, Ind., and Chicago, recently visited Atlanta and it is reported that he plans to open an automobile factory here.

UTICA, N. Y.—The Millers Motor Company, 109 Arcade building, with garage at 7 Jewett place, has taken the agency for the Metz automobile made by Charles Metz, a former Utican.

DETROIT, MICH.—C. A. Hamilton, who has been vice-president and general manager of the Wisconsin Engine Company, has resigned his position to take an interest in the Lavigne Gear Company.

COLUMBUS, O.—The Adamson Automobile Company, of 5 West Mound street, has taken the distributing agency for the Paige-Detroit for Franklin, Delaware, Madison, Pickaway and Union counties.

PROVIDENCE, R. I.—W. P. Kennedy has been appointed head of the transportation cost bureau which has been established by the American Locomotive Company in connection with the motor truck department.

CUMBERLAND, MD.—The partnership of Blays & Cochrane, trading as the Queen City Garage, has been changed to the Queen City Garage, Inc., B. H. Blays having disposed of his interest to the latter corporation, of which Alpheos B. Cochrane is the president.

ANDERSON, IND.—Mr. J. L. Elwood has affiliated with the service department of the Remy Electric Company, with headquarters at the factory in this city. Mr. Elwood was lately engineer of the Sam'l L. Moore Sons' Company, of New York City and Elizabeth, N. J.

KANSAS CITY, Mo.—The Missouri Valley Auto Company has been placed in the hands of a receiver. The company handled the

White car and was one of the oldest firms in the city. The White Motors Company, a newly organized concern, will handle the White at 1616 Grand avenue.

BOSTON, MASS.—The J. W. Bowman Co., distributors of the Stevens-Duryea cars, is to have one of the largest and most completely equipped service stations possessed by any automobile dealer in New England. It is being erected on Vassar street, Cambridge, and is a one-story structure with 30,000 square feet of available floor space.

DENVER, COL.—The Western Marion Motor Company, which handles the Abbott-Detroit and the Marion for this territory, will begin the new year under the name of the Western Motor Car Company. This firm was also recently made the agent for the American self-starting device.

NEWCASTLE, IND.—W. F. Byrket, who has been connected with the United Motor Company in various capacities for several years, has been appointed manager of the United Motor Indianapolis Company. He succeeds Thomas L. Marshall, who will become assistant superintendent of the company's central sales district.

CLEVELAND, O.—A reorganization of the Motor Tire & Repair Company at 6506 Euclid avenue has been effected. E. C. Anderson continues as the active head of the company. Those associated with him are: H. L. Lance, C. B. Haycox and C. A. Stimson. The company will continue to handle the Republic car.

SEATTLE, WASH.—J. T. Geena & Company, Packard agents are erecting a new building on the southeast corner of Pine street and Twelfth avenue. When completed the Packard building will be one of the most complete, modern automobile salesroom and garage buildings on the Pacific Coast. It will have about 40,000 square feet of floor space.



First annual convention of the Speedwell truck agents, at the factory in Dayton, Ohio



Showing the average weekly output of Knox trucks for 1911

WAPAKONETA, O.—The Hauss & Bitler Company has taken the 1912 agency for the Stoddard-Dayton in this territory.

LOS ANGELES, CAL.—Curtiss-Shea-Cox, Inc., are planning to erect a plant in this city for the manufacture of automobiles.

COLUMBUS, O.—Messrs. Sperry and Hoover have taken over the repair business of the Adamson Automobile Company at 35 West Mound street.

BOSTON, MASS.—The Henley-Kimball Company, agent for the Hudson, is having a service station constructed in Cambridge.

SCRANTON, PA.—Application for a patent for a flexible steel tire for automobiles has been made to the government by John Dougherty, of 1003 Prospect avenue.

PONTIAC, MICH.—Pontiac Power Company, which recently acquired the Rapid Motor Vehicle Company's power plant, has been authorized to expend \$36,000 in improvements.

SPRINGFIELD, ORE.—A company has been organized here by D. Tower for the manufacture of automobile trucks. Local capital has been subscribed and a small factory has been started.

KANSAS CITY, MO.—The Hartford Suspension Company, manufacturer of the Traffault-Hartford shock absorber, has opened a branch factory at 1542 Grand avenue. Harry Roemer is manager.

BOSTON, MASS.—Roscoe B. Davis, for several years with the Maxwell branch in Boston and later with other agencies, has joined the sales force of the Empire Motor Car Company, agent for the Empire and Stutz cars.

NEW HAVEN, CONN.—Knight's Garage, Inc., of this city, has closed with Harold D. Bornstein of the Velie Boston branch for the sale of Velie pleasure and commercial cars in New Haven and New London counties.

DETROIT, MICH.—Henry Goodman, eastern traveling salesman for the Flanders Manufacturing Company, has resigned his position and accepted a position with the Grinnell Electric Car Company, of Detroit, as general sales manager.

COLUMBUS, O.—The net receipts of the Ohio State Automobile Department for the year ending December 15, 1911, were \$156,680.65. This amount goes to the fund for the building and maintenance of good roads in the Buckeye State.

KENTON, O.—William Willeke of this city is the inventor of a device to regulate gas tanks on automobiles, which is claimed to be the best of its kind ever conceived. An automobile manufacturing concern is negotiating for the purchase of the device.

DETROIT, MICH.—J. H. Newmark, for four years advertising manager of the Oakland Motor Car Company, of Pontiac,

Mich., has resigned that position, having been advanced by the General Motors Company to the advertising department of the parent organization in this city.

DENVER, COL.—The handsome two-story building erected by Tom Botterill at the corner of Thirteenth and Broadway is now occupied by the owner, who handles the Pierce-Arrow, the Hudson and the Columbus, and by the Colorado Automobile Company, local representative of the Cadillac.

DETROIT, MICH.—Automobile Designing Engineers' Society, an organization intended to promote the art of designing automobile motors, motor cars and tools, was formed recently at a meeting held in College of Automobile Engineering. Regular meetings will be held at the college, 287 Woodward avenue.

LIMA, O.—Two storerooms located on the east side of South Elizabeth street between Market street and Spring street, have been leased for automobile salesrooms. Henry S. Thurston will occupy one of the rooms as an agent for the Jackson line and G. W. Griffith the other as agent for the Krit.

CANTON, O.—The directors of the Stark Auto Company of this city, which was incorporated recently with a capital of \$20,000, have elected W. H. Burgener president; T. E. Huthe, general manager; Samuel Heaney, shop manager; George Shaffer, vice-president and George F. Frones, secretary and treasurer.

MILWAUKEE, WIS.—Among the new agencies in Milwaukee recently contracted for are the following: Union 25, Marx Bros.; Staver-Chicago, Henry Walter; Nyberg, Tuschan Bros.; King, Eustace Bros.; Arthur F. Tiegs, Colby; Gas Power Engineering Company, Premier and Moline; Elmore, Edwin B. Leverenz.

BOSTON, MASS.—W. H. Vinal has returned from a trip to York, Pa., where he closed a deal for the agency for Pullman cars in Eastern Massachusetts. He will at once assume the management of the Boston Motor Company, which handles the S. G. V. and the De Dion.

SPRINGFIELD, MASS.—The phenomenal growth of the truck industry in the United States is readily appreciated when one realizes that the line of trucks shown in the accompanying illustration represents only one week's output of the Knox Automobile Company of this city.

ATHENS, O.—The Ohio-West Virginia Sales Company of this city has taken the agency in southeastern Ohio for the Cutting touring cars and the Garford trucks. F. E. Shattuck is manager of the concern.

COLUMBUS, O.—The Adamson Automobile Company of 35 West Mound street, has contracted to distribute the Paige-Detroit line for 1912 in Franklin, Delaware, Madison, Pickaway and Union counties.

MILWAUKEE, WIS.—C. E. Mills has joined the Hickman-Lauson-Diener Company, state agents for the Ford.

CINCINNATI, O.—The Payne Motor Car Company, distributing the Hudson, has removed to 122-124 Seventh avenue.

PENDLETON, ORE.—A new garage and repair shop has been opened here under the title of the Oregon Motor Company.

LANCASTER, O.—The Adamson Automobile Company of Columbus, Ohio, has contracted with J. Elden Lawrence to handle the Jackson in Fairfield county.

COLUMBUS, O.—Kimmel Brothers, 215 North Fourth street, will handle the Cole line of automobiles in connection with the Speedwell.

DES MOINES, IA.—W. C. Haywood, Secretary of State for Iowa, has issued a pamphlet containing a synopsis of the new automobile laws passed by the last legislature.

BOSTON, MASS.—H. E. Leefe, formerly with the local branch of the Selden, is the latest addition to the salesforce of the Connell & McCone Company, agents here for the Overland.

MILWAUKEE, WIS.—The Milwaukee board of public works has purchased a Mitchell roadster for the use of the consolidated police and fire alarm telegraph system of the city.

NEENAH, WIS.—William C. Nash has been elected president of the Neenah Brass Works. Henry Horkman is vice-president and general manager and David Horkman is secretary and treasurer.

SPRINGFIELD, MASS.—The United Motors Company secured an option on a large tract of land in the center of the city as a site for a large building which will be utilized as a salesroom and a garage. It will cost \$150,000.

SYRACUSE, N. Y.—W. R. Shaw has purchased the entire stock held by the Strait estate in the automobile firm of Strait & Shaw and assumes sole ownership January 1. He will continue to conduct the business at No. 225 West Genesee street.

SAGINAW, MICH.—By the purchase of the stock of Charles E. Duryea, former president of the Duryea Auto Company, by C. C. Brooks, the legal difficulties in which three injunctions were issued, has been ended. Frank C. Palmerton has been elected president and general manager, which offices Mr. Duryea held.

COLUMBUS, O.—The Broadway Motor Car Company, 842 and 844 West Broad street, is the name of a firm formed by J. F. Morgan and H. F. Kaiser to handle the Paige-Detroit in Franklin county for 1912 and to do a general garage and repair business. The concern has a new building.

BOSTON, MASS.—F. R. Parker, who formerly handled the Elmore in this territory, has signed a contract with the United States Motors Company to distribute Brush cars throughout New England. He has also taken on the Staver-Chicago line for Maine, New Hampshire, Vermont and Massachusetts.

DETROIT, MICH.—The Wolverine Automobile club has made arrangements with the Michigan Central Railroad to run a special to the New York show. The train, consisting of standard sleepers, a compartment car and a buffet library car, will

leave at 3:30 o'clock Friday afternoon, arriving in New York at 9 o'clock Saturday morning. A large delegation is arranging to go from the club.

WINNIPEG, MAN.—At the annual meeting and banquet of the Winnipeg Motor Trades' Association, the following were re-elected by acclamation as officers for 1912: president, F. E. H. Lake, Russell Motor Car Company; vice-president, W. C. Power, McLaughlin Carriage Company; treasurer, G. A. Malcolmson, Ford Motor Company; secretary, A. C. Emmett, automobile editor of *Free Press*.

Automobile Incorporations

AUTOMOBILES AND PARTS

AUSTIN, TEX.—Regal Motor Car Co.; capital, \$1,000,000; to sell automobiles and parts.

BOSTON, MASS.—Orin Ray, Inc.; capital, \$50,000; to deal in automobiles. Incorporators: O. Ray, W. N. Tuller, H. O. Ray.

BOSTON, MASS.—Stratton Automobile Co.; capital, \$5,000; to deal in automobiles. Incorporators: H. C. Stratton, J. S. Stratton, G. W. Stratton.

BOSTON, MASS.—Rex Motor Co.; capital, \$1,000; to deal in automobiles. Incorporators: H. C. Stetson, H. W. True, C. F. Moore.

BROOKLYN, N. Y.—Ormond Motor Car Co.; capital, \$100,000; to deal in automobiles. Incorporators: G. H. Howell, R. McKeller, T. Downs.

BUFFALO, N. Y.—Carroll Tire Co.; capital, \$20,000; to manufacture rubber tires. Incorporators: John Gregson, George Cunliffe, J. E. Gregson.

CHICAGO, ILL.—Swanson Motor Car Co.; capital, \$50,000; to deal in automobiles, trucks, etc. Incorporators: C. E. Swanson, E. E. Challenger, M. E. Gallion.

CHICAGO, ILL.—La Salle Auto Oil Co.; capital, \$25,000; to manufacture automobile motors and accessories. Incorporators: W. R. Watson, G. W. Curtis, L. E. Powell.

CHICAGO, ILL.—Perfection Auto Tire Co.; capital, \$15,000; to manufacture automobile parts and appliances. Incorporators: R. E. Cruzen, G. R. Cruzen, D. C. Hutchins.

CHICAGO, ILL.—Mechanical Appliance Co.; capital, \$200,000; to deal in motors and generators. Incorporators: W. A. Feeney, Frank Venning.

CLIO, S. C.—Hubbard Motor Car Co.; capital, \$3,000; to deal in automobiles. Incorporators: J. L. Hubbard and others.

DOVER, DEL.—Motor Owners' Tire Co.; capital, \$300,000; to manufacture and deal in automobile tires and other fixtures.

DOVER, DEL.—Samson Tire & Rubber Co.; capital, \$100,000; to manufacture rubber tires for automobiles.

HATTIESBURG, MISS.—Southern Automobile & Machine Co.; capital, \$50,000; to deal in automobiles. Incorporator: R. R. Boykin.

INDIANAPOLIS, IND.—Empire Gear Co.; capital, \$20,000; to manufacture motors, transmissions and other automobile parts. Incorporators: Frank S. Clark and Charles H. Hurd.

KANSAS CITY, KAN.—Kansas City Auburn Co.; capital, \$10,000; to deal in motor trucks. Incorporators: Charles Eckhart, F. E. Eckhart, Morris Eckhart.

MILWAUKEE, WIS.—Automatic Motor Devices Co.; capital, \$1,000; to sell automatic automobile accessories. Incorporators: H. B. Webb, C. J. Dellfield, J. T. Drought.

NEWARK, DEL.—New Garage & Electric Co.; capital, \$5,000; to manufacture and deal in automobiles. Incorporators: G. Fader, E. G. Fader, A. F. Fader.

NEW YORK CITY.—Detmar Auto Sales Co.; capital, \$20,000; to manufacture and deal in vehicles, engines and machinery. Incorporators: John McLaren, B. F. Knowlton, Edward C. Underlied.

OMAHA, NEB.—Omaha Auburn Auto Co.; capital, \$10,000; to deal in automobiles. Incorporators: Charles Eckhart, Morris Eckhart.

SALEM, N. J.—Blue Ribbon Automobile Service Co.; capital, \$25,000; to rent automobiles and deal in automobile supplies. Incorporators: G. B. Sheppard, J. D. Shearman, F. E. Hurley.

SPRINGFIELD, MASS.—Morse-Readio Auto Co.; capital, \$150,000; to manufacture and deal in automobiles. Incorporators: G. U. Readio, G. E. Morse, E. M. White.

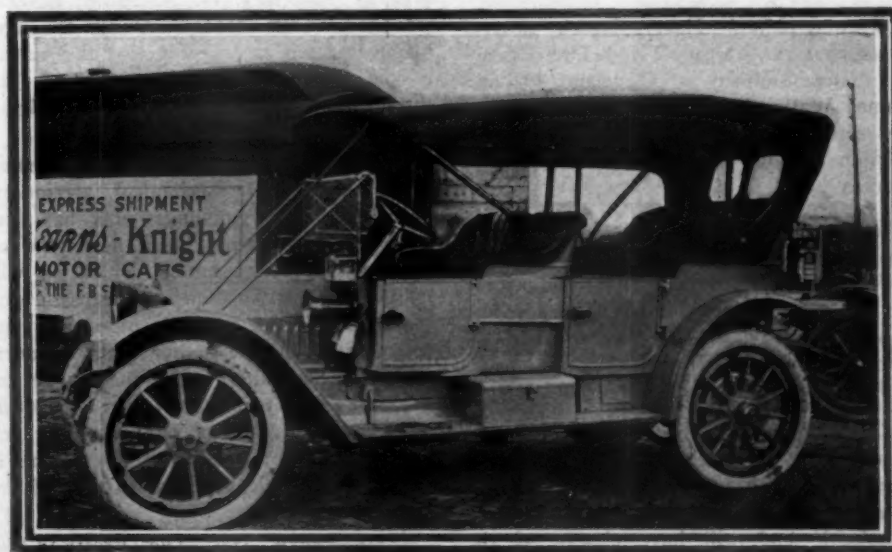
WILMINGTON, DEL.—American Tire & Rubber Co.; capital, \$1,500,000; to manufacture rubber tires.

AUTOMOBILES, GARAGES, ETC.

SPRINGFIELD, MASS.—New England Auto Owners' Association; to obtain supplies at a lower price. Incorporators: R. A. McKee, A. W. Warren, M. T. Workman.

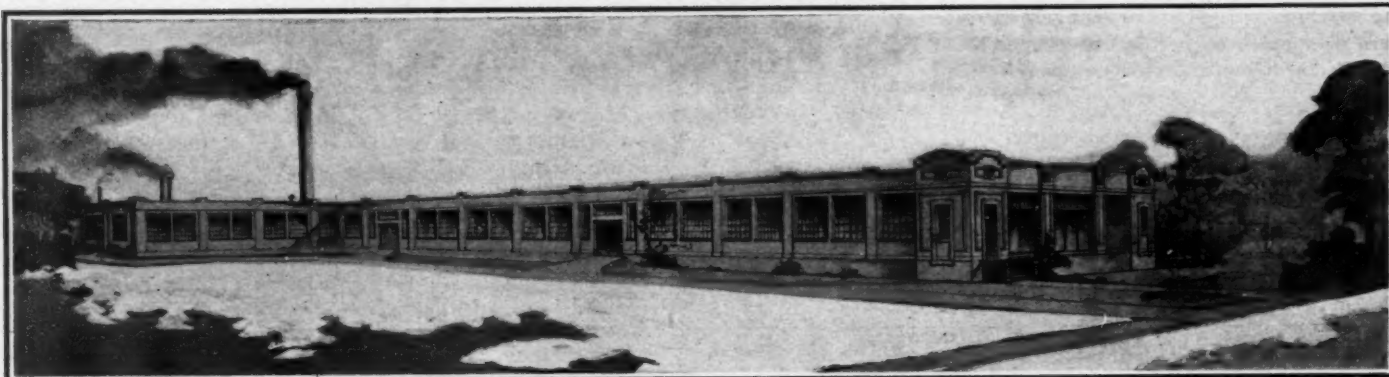
SPRINGFIELD, OHIO.—Compressed Air Machine Co.; capital, \$100,000. Incorporators: Lewis C. Kiser and others.

TOLEDO, OHIO.—Toledo Auto Delivery Service; capital, \$10,000; to conduct a transportation business. Incorporators: Chas. K. Friedman, Joseph Straus, Kittie Alexander, Joseph Alexander, Morris Tobias.



Unloading shipment of Stearns-Knight cars at San Francisco

OF INTEREST *to the* INDUSTRY



New plant of the Republic Motor Car Company at Hamilton, Ontario.

HAMILTON, O.—The new plant of the Republic Motor Car Company is of heavy type mill construction, with exceptionally large window space. The window frames are all steel and the entire building is absolutely fire-proof. It will be ready for occupancy January 15.

CHICAGO, ILL.—The Chicago Commercial Car Company is building a new factory on the North Side on the railroad and Evanston avenue. The new building will be occupied on January 1.

DALLAS, TEX.—The Firestone Tire & Rubber Company will open a direct factory branch in this city January 1. It will be located at 1521 Commerce street and will be under the management of Mr. P. B. Talbott.

CUDAHY, WIS.—The new office building of the Federal Rubber Manufacturing Co. on Layton avenue will be ready for occupancy about January 1. It is two stories high, of red press-brick construction and a model structure of its kind.

BOSTON, MASS.—Harry Israel, general sales manager of the O'Neil Tire Protector Sales Company of Cleveland, O., and James Watters, who is the New England representative of the firm, have been in Boston seeking a location to open a branch here.

BROOKLYN, N. Y.—As has been its custom for a number of years, the Moller & Schumann Company had its selling force at the factory on Monday, Tuesday and Wednesday of last week for the usual annual conference. The meeting was probably the most successful ever held.

GRAND FORKS, N. D.—A new Ford branch has just been opened under the name of the Ford Automobile Company. The new house will be both retail and wholesale and will have charge of the distribution of Ford cars in contiguous Minnesota and North Dakota territory.

DALLAS, TEX.—Following the policy of establishing branch service stations in all parts of the country, the Remy Electric Company of Anderson, Ind., has opened a service station and supply house in Dallas, Tex. The establishment will be known as the Remy Service Station and will be in charge of Mr. M. A. Price.

BATAVIA, N. Y.—The Batavia Rubber Co. has increased its capital stock from \$70,000 to \$500,000. Options have been secured on several large tracts of land adjacent to the factory. The new capital will be used in the extension of the company's plant, in securing additional machinery and equipment and in other ways tending toward a largely increased output. The company makes a specialty of its patented Security non-skid tire. It has added a solid tire to its line.

MASON CITY, IA.—The controlling interest of the Colby Motor Co., has changed hands. New officers were elected as follows: President, J. E. Burmeister; vice-president, Wm. C. Colby; treasurer, H. S. Murphy; secretary, W. N. Smith; general manager, D. W. Henry. Under the new management it is expected that the output of the factory will be increased and that the line of trucks will rapidly be completed and put on the market.

KEWAUNEE, WIS.—O. O. Storle, inventor of a number of mechanical appliances, such as valves, couplings, etc., has just been granted patents on a new type of gasoline engine or motor, which he will manufacture at Kewaunee. The feature of the engine is the employment of two piston heads and rods in each cylinder, which is claimed to make the engine capable of doing twice the work of the ordinary engine at the same expense for fuel. The expense of producing the engine is said to be practically equal to that of the ordinary engine.

INDIANAPOLIS, IND.—The Presto-O-Lite Company of this city now has agents and branches in the Hawaiian, Philippine and

West Indian Islands as well as in Canada, Mexico, Germany and Australia. These branches help to solve the shipping problem, as all steamship bills-of-lading specify that all tanks on cars being shipped shall be empty.

CLEVELAND, O.—A \$350,000 corporation has been organized by the Grant Lees Machine & Tool Company and the Stuyvesant Motor Car Company to manufacture the Stuyvesant automobile or rebuilt Gaeth car. The new corporation will take the name of the Stuyvesant Motor Car Company. The entire plant of the Stuyvesant Motor Car Company, now located on the West Side, will be moved to the East End within sixty days.

TACOMA, WASH.—Uniform prices of supplies and work are to be fixed by Tacoma automobile men, who met recently at the Chamber of Commerce and organized the Tacoma Automobile Dealers' Association, with Edwin C. Chambers as president; T. W. Little, vice-president; Harry W. Doherty, secretary and treasurer and C. L. Ross, W. W. King and E. C. Reynolds trustees. Committees were appointed to work with the association in the regulation and forming of uniform rates on supplies and garage work.

BRYAN, O.—Announcement is made that C. H. Bowersox, of the Bowersox Motor Sales Company, of this city, will open a sales room in Toledo for the handling of the Everitt line of cars. The sales rooms at Bryan will be retained, the company operating both places. The western half of the territory controlled by the company will be handled from Bryan, while the Toledo office will take care of the eastern territory. A manager will be placed in charge of each salesroom and Mr. Bowersox will devote his time to placing sub-agencies in the territory. Arrangements have been made whereby space will be secured in the building now occupied by the Gamble Motor Car Company on Madison avenue.

PATENTS GONE TO ISSUE

WIND-SHIELD—Of the flexible type with a frame adjustable in various positions.

3. The shield (Fig. 1) comprises spaced supports, connected at their lower ends by a transverse member. The supports may be adjusted longitudinally through spaced guides open above and below the supports, which are provided with means for maintaining them in different positions of longitudinal adjustment. A flexible shield is connected at one end with the member above mentioned, and is free and unobstructed above the same; a roller is mounted below the member mentioned and connected with the lower part of the flexible shield, the roller being supported by the guide supports.

No. 1,012,239—to Theodore F. Bourne, Montclair, N. J. Granted, December 19, 1911; filed, December 24, 1910.

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES—In which the spark plug terminals serve as contact makers for the ignition circuit.

1. In this system (Fig. 2) a number of cylinders with a spark plug in each are combined with a number of separate insulated conductors contained in a tube passing closely by the spark plugs and having an opening opposite each spark plug. At each opening a holder is secured to the tube, the holder containing a terminal member which makes contact with one of the conductors. Pivoted switch arms supported by the holders and in position to make contact with the spark plugs, are thereby caused to close a circuit between them and the conductor terminals.

No. 1,011,977—to Allen Loomis, Detroit, Mich., assignor to the Packard Motor Car Co., Detroit, Mich. Granted December 19, 1911; filed December 27, 1907.

TURNBUCKLE—Device containing arms ending in sleeves.

The turnbuckle yoke (Fig. 3) referred

to in this patent comprises an integral casting having spaced arms terminating in sleeves joining their ends. The sleeves have registering openings, and the arms have also cross bars spaced inwardly from the sleeves and provided with openings registering with the sleeve openings.

No. 1,012,008—to William F. Post, Asheville, N. C. Granted December 19, 1911; filed November 14, 1910.

CRANKING DEVICE—Crank for internal combustion motor containing provision against back kicks.

4. This patent refers to a device comprising a starting shaft which may be connected with the crankshaft of an engine and which is provided with a laterally projecting coupling pin. On the starting shaft a crank is loosely mounted and is provided with a sloping driving shoulder adapted to engage the pin. A ratchet mechanism is interposed between the crank and a stationary part, which mechanism permits of forward turning movement of the crank, but which prevents backward turning movement thereof. The ratchet mechanism comprises a disc mounted on a stationary part and provided with an annular row of ratchet teeth, and a spring-pressed pawl which is pivoted on the hub of the crank and engages the teeth of the ratchet.

No. 1,012,116—William Van Scoter, Buffalo, N. Y., assignor of one-fourth to William J. Hayes, Buffalo, N. Y. Granted December 19, 1911; filed February 13, 1911.

FORCE-FEED CARBURETER—A reciprocating member working in alignment with the supply pipe pumps the fuel into the carbureter proper.

1. The carbureter protected by this patent comprises a charge supply tube on which a carbureter casing is arranged. Through the casing extends an oil pipe which has inlet and discharge valves, and a reciprocating member aligned with the oil pipe is connected to a pipe for admitting pressure to it by a hollow flexible connection. A

second hollow and flexible connection is arranged between the oil conducting pipe and the reciprocating member which is stayed between the flexible connections by a fixed support. The member is provided with a flange in the path of which a sleeve is adjustably mounted in the fixed support.

No. 1,011,931—to Charles W. Farquharson, Chicago, Ill. Granted December 19, 1911; filed October 13, 1910.

TIRE-INFLATER—A tire pump which is driven by the engine to compress air for filling the tires.

1. This patent covers an apparatus consisting of a frame or casing and a driven mechanism carried by same and taking power from a driving member. This engages a driven member connected with the mechanism proper. Means are adjustably supported with respect to the driven member and engaging with the driving member at a point sufficiently removed from the point of engagement between driving and driven member, the means mentioned balancing partially the forces which tend to displace the driven member and permitting the latter to be held, by hand, in engagement with the driving member.

No. 1,012,098—to Enoch Rector, New York, N. Y. Granted December 19, 1911; filed August 3, 1910.

BACKFIRE EXTINGUISHING DEVICE—In which a baffle plate is used to resist the flame finding its way into the gas pipe.

2. This device comprises the combination of a supply pipe having a conically enlarged portion with an imperforate cone-shaped baffle member contained in the enlargement mentioned, the base of the baffle member being substantially flat and directed toward the point of consumption. A space is provided all around the baffle, the sectional area of this space being not less than that of the supply pipe.

No. 1,011,961—to Alexander Constantine Ionides, Jr., London, England. Granted December 19, 1911; filed December 5, 1910.

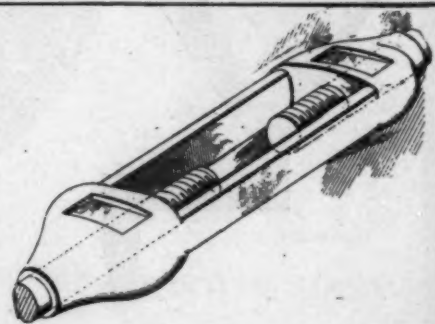
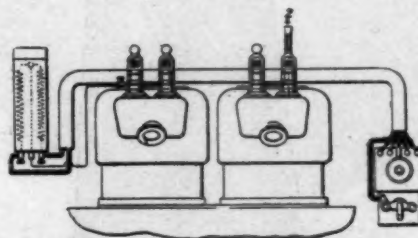
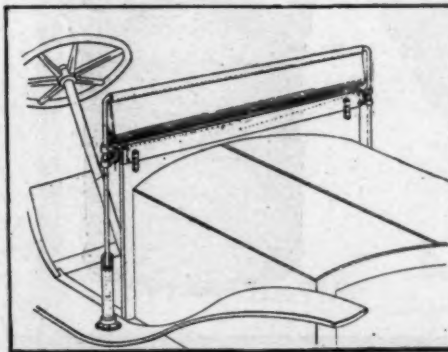


Fig. 1—Bourne windshield.

Fig. 2—Loomis ignition system.

Fig. 3—Post turnbuckle

Newest Ideas Among the Accessories

Dover Gasoline Vessels

IN Fig. 1 a special form of gasoline funnel, made by the Dover Stamping & Mfg. Company, of Cambridge, Mass., is shown. The funnel proper is attached to a crank-shaped filler pipe, which fits into the filler hole of any gasoline tank, so that the funnel may be put and left there while filling the tank with fuel. The funnel is heavily copper-plated and provided with brass strainers, as well as with a movable hoop to hold the chamois in place. A 4-quart funnel of this type has a top diameter of 9 3/4 inches, while the diameter of the outlet pipe is 7-8 inch.

The Duplex combination vessel, Fig. 2, does the combined work of a measure and funnel. It is a cylinder which converges slightly toward the top carrying a funnel which has a spout pointing upward. The effect of this design is that when the measure is set down all the liquid runs back into the vessel instead of dripping outside. A double pouring lip is provided, one being the end of the funnel and the other attached directly to the top of the measure, providing a fast pouring measure where vessels with large opening are being filled.

The handle being on the side increases ease of operation, and on the larger sizes—this combination measure and funnel is made in five sizes—the handles have bosses. The entire device is made of extra-heavy material and the seams are soldered and guaranteed against leak. The vessel is copper-plated and laquered. The five sizes range from 1/2 pint to 4 quarts, all being designed along identical lines, and being furnished either in polished tin, or heavy

copper-plates, or copper-plated and provided with brass strainers, to keep foreign matter from entering the tanks.

Fig. 3 shows the Dover non-evaporating gasoline measure, which is made for garage use with a capacity of 5 gallons. As may be seen from the figure, the pouring lip and filler opener in this case are one, the filler opener being in the shape of a rotary valve when in place. By turning the filler opener to a certain position, an opening in its side wall is brought to register with the pouring lip so that the fuel can be poured into the gasoline tanks without removing the filler opener of the measure. If only part of the contents of the measure is used for filling the tank, the rest is stored and kept from evaporating by so plating the filler opener in position that the interior of the tank is cut off from the surrounding air.

E-Z-2 Work Vulcanizer

The above named product of the E-Z-2 Work Steam Vulcanizer Company, of Cleveland, Ohio, is constructed along similar lines and on identical principles with the big steam vulcanizers used in tire factories. The vulcanizer proper is a hollow brass body which is partly filled with water at the factory of the makers, and being closed hermetically never needs refilling. An alcohol lamp under the brass steam boiler provides the heat for transforming the water into steam which heats the metal wall of the brass body by contact. There is no need of watching the heating water and steam, which operation is entirely automatic, since the apparatus is self-con-

tained. One side of the brass body is curved to fit a casing, while the flat side may be applied to tubes requiring vulcanizing. A thermometer connected with the interior of the steam chamber tells the exact temperature of the metal applied to the rubber, so that with a little attention there is no chance of burning the rubber. The machine is composed of few parts, all made of highly polished, nicked brass.

Minimax Extinguisher

Fire in the garage is the signal for cause of the destruction of a large number of high-priced machines every year and it behooves the owner of such an edifice to maintain as good a fire protection as he can possibly buy. The effects of a conflagration can never be calculated but it is true that promptness and effectiveness in the extinguishing agent is of the highest importance. These features are embodied in the Minimax, made by the Minimax Company, of Philadelphia, Pa. The acid in this device is kept in a hermetically sealed bottle and is not exposed to any other chemical until it is ready to use in a fire. A plunger is pushed in which brings the acid into contact with the soda-water, generating an acid gas which creates a pressure of 60 pounds to the square inch. The 1 1/2 gallons of liquid will perform the work of 50 ordinarily filled water pails and in the case of fires caused by gasoline or oils will have far greater effect since water is useless on a fire of this nature. The stream from the Minimax will reach a distance of 50 feet.



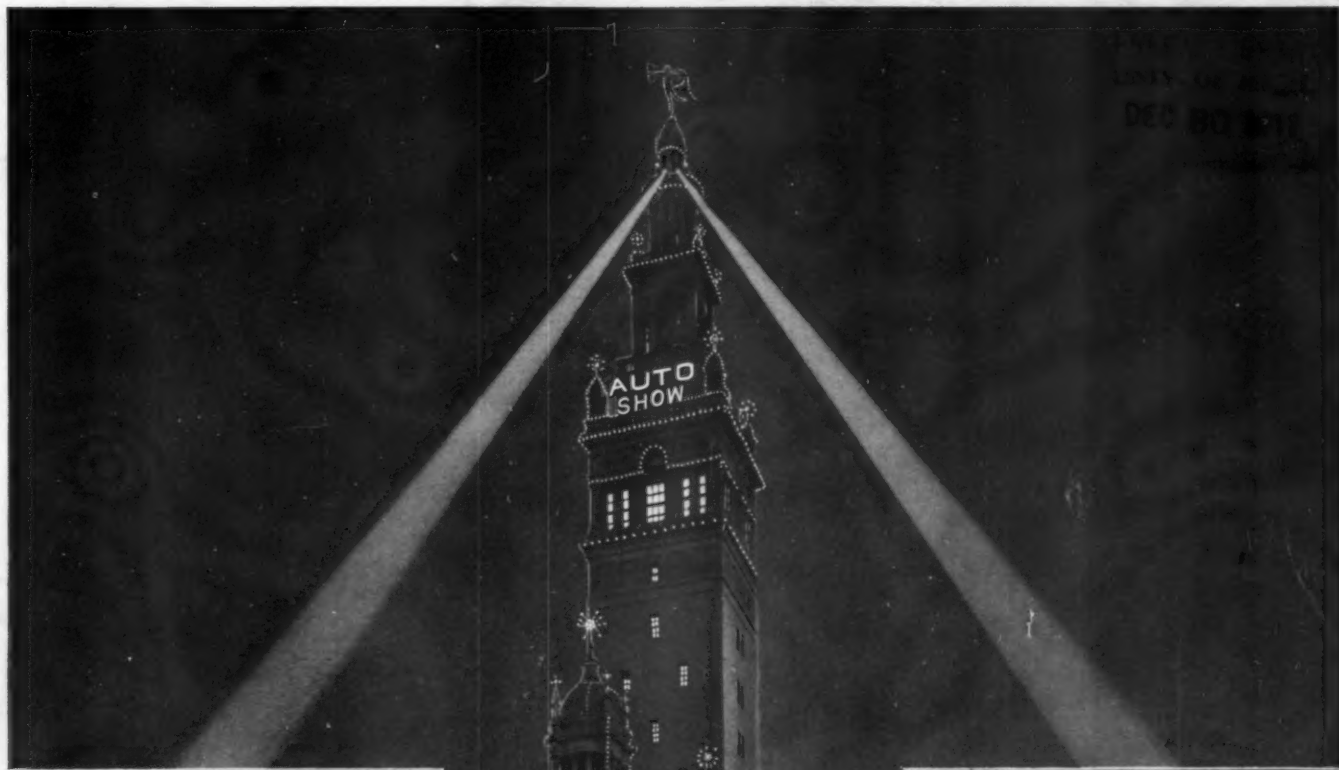
Fig. 1—Dover offset gasoline funnel. Fig. 2—Duplex combination vessel. Fig. 3—Dover non-evaporating gasoline measure for garages

THE AUTOMOBILE

Vol. XXV
No. 26

NEW YORK, DECEMBER 28, 1911

Weekly
Price Ten Cents



Lighting Dynamo

This highly efficient system lights lamps, charges batteries, furnishes current for power horn. It is driven by the motor, requires no attention and only 1/6 H.P. is needed to operate it. Without question the finest system the world produces.

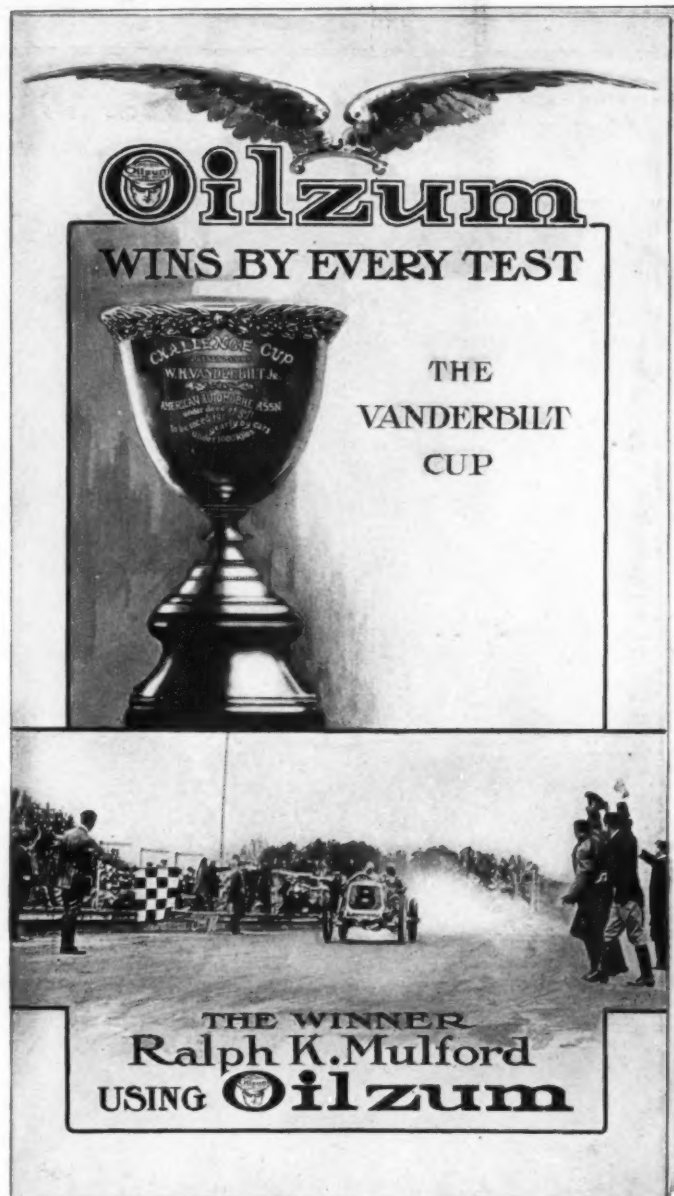
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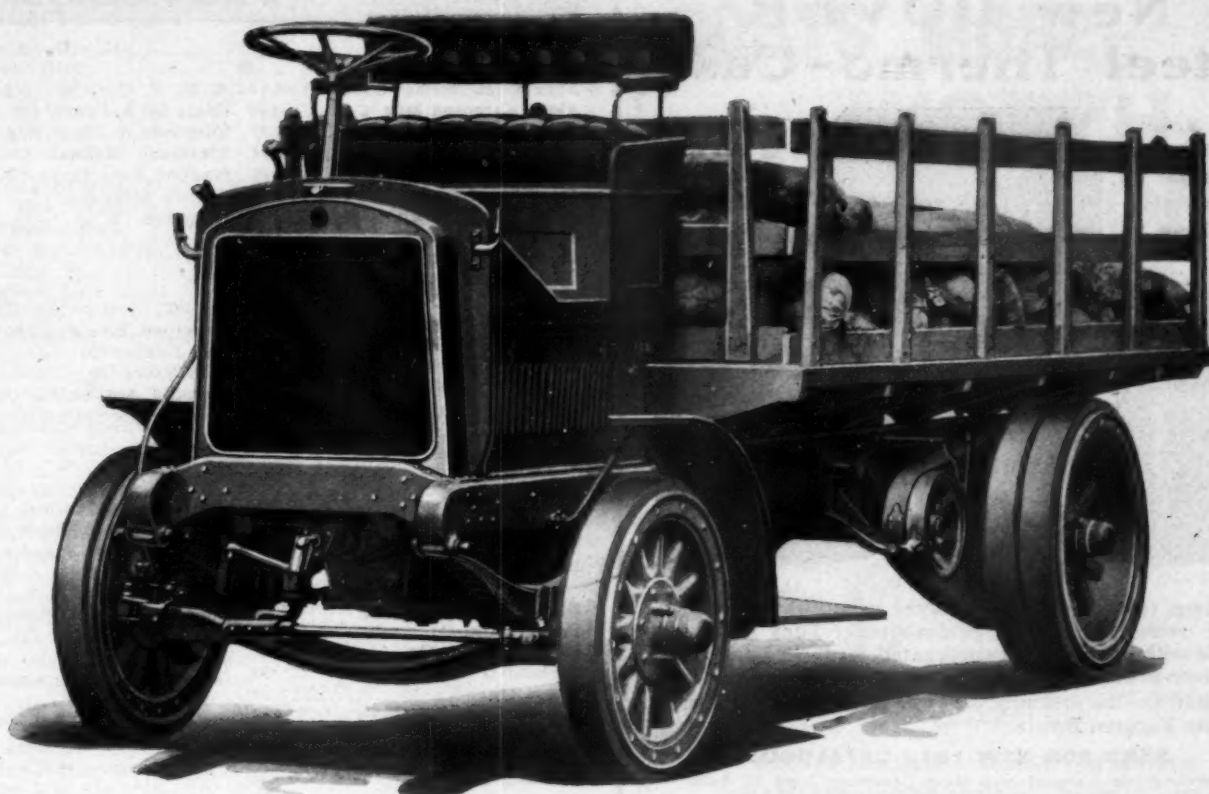
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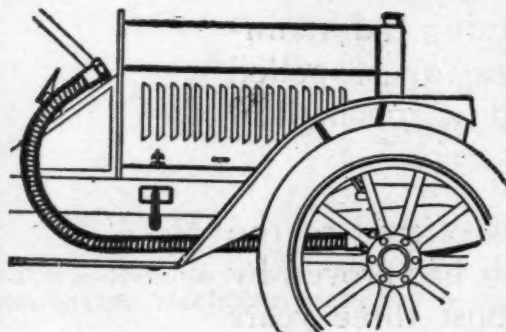
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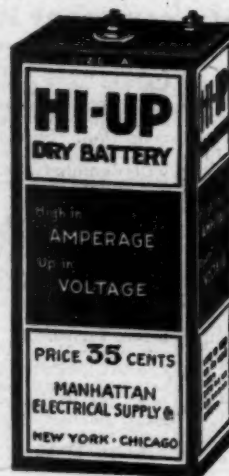
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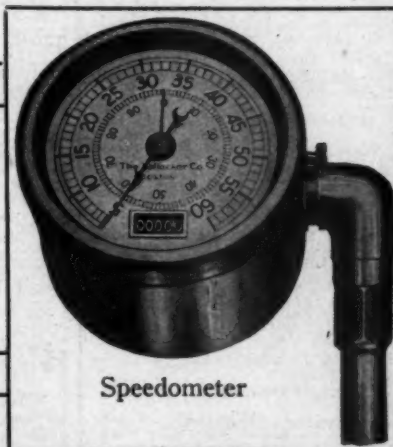
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One 50 Demonstrator, 7-passenger body, with top.

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Factory,
Newark, N. J.

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We have purchased the repair business of the Mora cars, including all stock on hand, drawings, patterns, jigs, office records and the right to receive the mail of the Company.

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1 Carburetor 5.50
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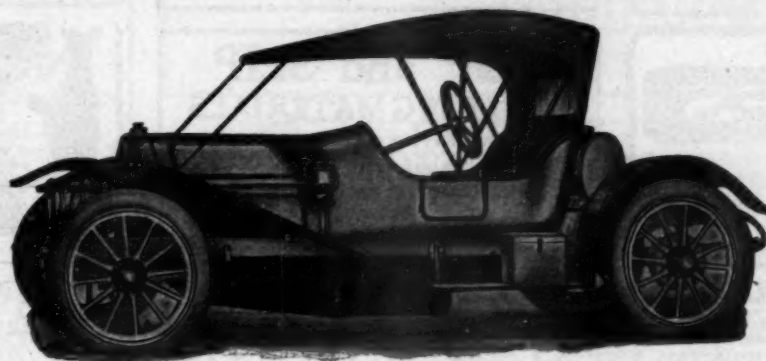
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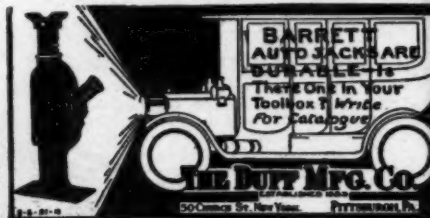
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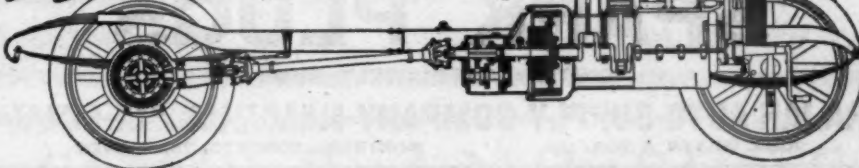
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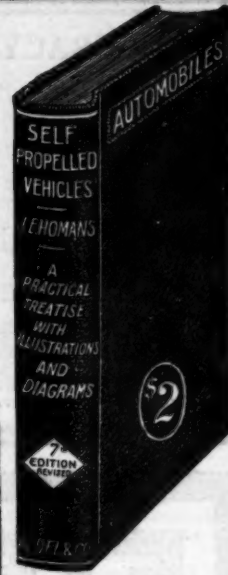
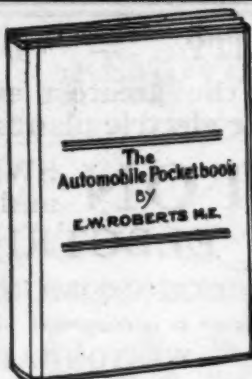
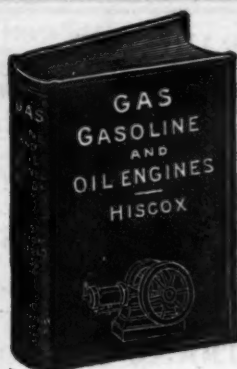
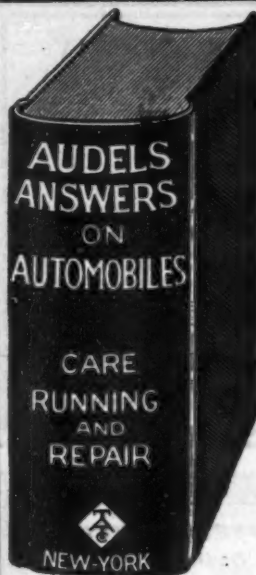
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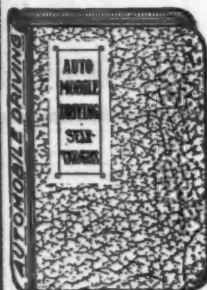
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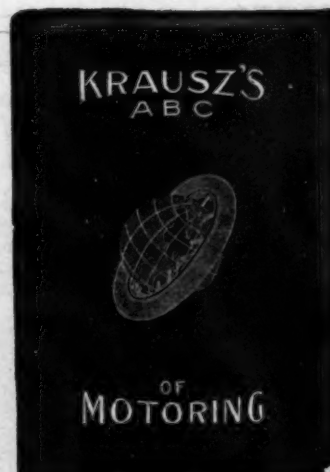
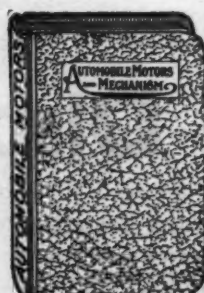
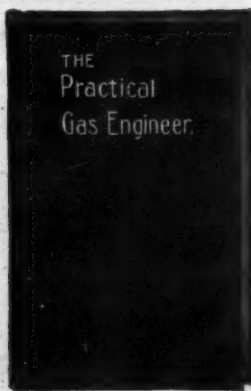
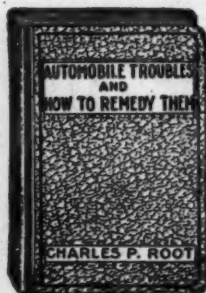
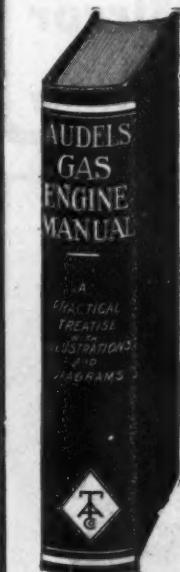
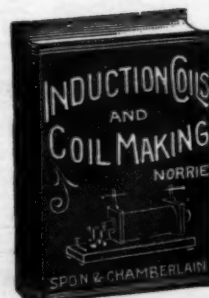
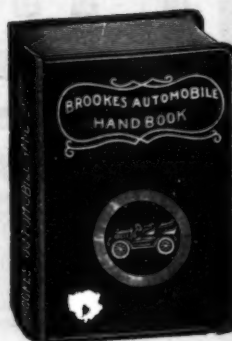
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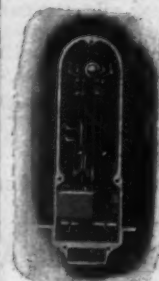
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FACTURER
WHO IS
LOOKING
FOR QUALITY

THE TURNBULL WAGON CO.

DEFIANCE, OHIO

Please mention The Automobile when writing to Advertisers

STRENGTH from Chrome Vanadium Steel costing us many times ordinary steel prices; oil tempered, not merely flashed in oil or chilled in water, the old wrong way for tempering. Tested physically to withstand 40 tons to the square inch without taking a permanent set, there is no equal to

Cleveland-Canton "Chrome Vanadium" Automobile Springs

Combine flexibility and strength to best meet all strains, jars or vibration from load, road, or engine. For Motor Trucks, Tractor Engines, Auto Cabs and all Motor Vehicles. Give Longest Service and

SAFETY

Best Grade: "Chrome Vanadium." Next Best: "Special Analysis."

THE CLEVELAND-CANTON SPRING CO. Canton, Ohio 23



No road too rough,
no hill too steep for the
car that carries

THE RUTENBER MOTOR

It has made more reputations and broken more records than any other motor.

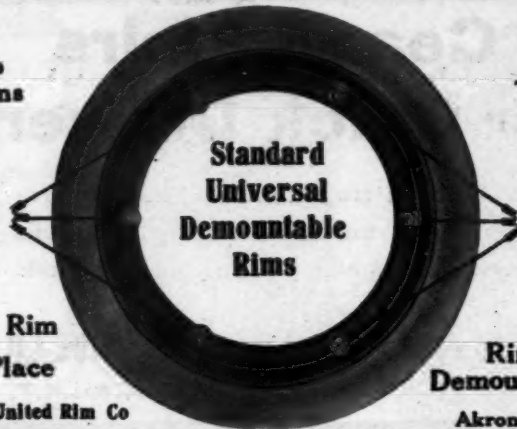
The Western Motor Co., Marion, Ind.

Two
Turns

L
O
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the Rim
in Place

The United Rim Co



Two
Turns

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L
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the
Rim for
Demounting

Akron, Ohio



You shouldn't expect good service

from an automobile, motor boat or motor-cycle if you handicap it with poor spark plugs.

Let the



do your sparking and 'twill be done well and economically.

All Sizes—All Styles—All Dealers—\$1.00

See our exhibit, space 625-626 Madison Square Garden Show, Jan. 6 to 20, 1912.

Emil Grossman Company

250 West 54th Street

New York City

Factory & Western branch, 844 Woodward Ave., Detroit.



Patent Luxury Folding Seats

Made from steel drop forgings; artistic in design and finish; compact, rugged and durable.

A necessity of high grade car equipment. Write for catalog showing various models.

HODGE & GRAVES CO.

AMESBURY, MASS.

The Practical Gas and Oil Engine Hand-Book



Price
\$1.50

A MANUAL of useful information on the care, maintenance and repair of Gas and Oil Engines. This work gives full and clear instructions on all points relating to the care, maintenance and repair of Stationary, Portable and Marine, Gas and Oil Engines, including Low to Start, Low to Stop, How to Adjust, Low to Repair, How to Test. Pocket size, 4x6 1/2, 200 pages. With numerous rules and formulas and diagrams, and over 50 illustrations, by L. Elliott Brookes, author of the "Automobile Hand-Book." This book has been written with the intention of furnishing practical information regarding gas, gasoline and kerosene engines, for the use of owners, operators and others who may be interested in their construction, operation and management.

Edition
de Luxe,
Full
Leather
Limp.

The CLASS JOURNAL COMPANY, 231-241 W. 39th St., New York

EQUIP YOUR CAR NOW WITH



DORIAN REMOUNTABLE RIMS

They avoid tire-changing delays on the road. Safe, reliable and efficient.

To SEE a DORIAN demonstration is to REALIZE YOUR NEED for DORIANS.

Write today for booklet, prices and information.

Dorian Remountable Rim Company

Dept. 2, 1804 Broadway
NEW YORK

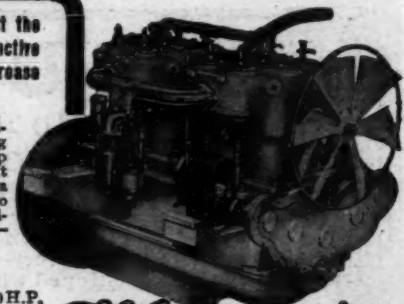
Here is a motor designed just the way you want it—it has distinctive features of construction that increase its efficiency and durability.

The crankshaft is of large diameter—a self contained oiling system supplied by a gear pump through the hollow crankshaft provides perfect oiling. The extra large bearings reduce friction to a minimum and increase durability. Double ignition system—magneto or battery or both.

5 Types—4 Cycle

3 1/2" bore, 5" stroke, 4 cyl., 25 to 30 H.P.
4 1/2" bore, 5" stroke, 4 cyl., 30 to 35 H.P.
4 1/2" bore, 5 1/2" stroke, 4 cyl., 45 to 50 H.P.
4 1/2" bore, 5 1/2" stroke, 4 cyl., 40 to 45 H.P.
5 1/2" bore, 7" stroke, 4 cyl., 50 to 55 H.P.

Wisconsin Motor Mfg. Co.
Dept. 28, Milwaukee, Wis.



Wisconsin
Motors

Please mention The Automobile when writing to Advertisers

FINISHED CRANK SHAFTS COMPLETE CONNECTING RODS COLD DRAWN STEEL SHAFTING

Screw Stock, Flats, Squares,
Hexagons and Special Shapes

FINISHED MACHINE KEYS MACHINE RACK

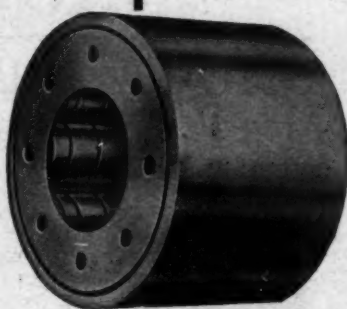
*All Material Finished to a Superior Degree
of Accuracy*

STANDARD GAUGE STEEL COMPANY
BEAVER FALLS, PA.

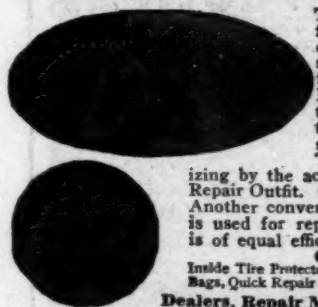
HYATT HIGH DUTY TYPE

ROLLER BEARINGS
are made from an
alloy steel with a very
high elastic limit, making
them capable of meeting
severe conditions better
than any other bearing.

HYATT ROLLER
BEARING COMPANY
DETROIT " " MICH.



Repair Inner Tubes With Ease and Speed



The Goodyear Self-Cure Repair Outfit offers the easiest, quickest and surest method of repairing inner-tubes. Simply clean the surface of the tube. Wash the raw gum surface of the Self-Cure Patch and stick it on. It sticks tight. The heat generated by friction within the tire vulcanizes the raw gum to a certain extent. Another good, tight-sticking patch is the White Seal Inner Tube Patch. Permanent repairs by vulcanizing by the acid process is the mission of our Acid-Cure Repair Outfit. Quick, permanent repairs can easily be made. Another convenient repair outfit is our No. 2 Outfit. This is used for repairing punctured tubes. Our No. 5 Outfit is of equal efficiency and convenience.

Other Goodyear Accessories
Inside Tire Protectors, Rim-Cut Patches, Lever Handle Grips, Inner Tube Bags, Quick Repair Gum, Protection Patches, Sifter Top Talc Tubes, etc. [246]

Dealers, Repair Men, Garage Men! For trade prices, write today to

The Goodyear Tire & Rubber Co., Freedom St., Akron, Ohio
Branches and Agencies in 103 Principal Cities

GOODYEAR



For the convenience of customers desiring immediate delivery, stocks of Shelby Seamless Steel Tubing are kept in many large cities; the location of stock nearest to any specified point will be given on request.

NATIONAL TUBE COMPANY, General Sales Offices: Frick Building, Pittsburgh, Pa.
DISTRICT SALES OFFICES: Atlanta, Chicago, Denver, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City. Pacific Coast Representatives—U. S. Steel Products Co., San Francisco, Seattle, Portland, Los Angeles.
Export Representatives: U. S. Steel Products Co., New York City.



Will not give trouble by hardening in cold weather like grease or oil.

TRY A CAN NOW

But be sure to look for above trade-mark on it.

N. Y. & N. J. LUBRICATING CO.

165 BROADWAY, NEW YORK

Specializing Light Commercial Vehicle Parts

REAR AXLES FRONT AXLES
PROPELLER SHAFTS

JACK SHAFTS HUBS AND WHEELS

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Peru Auto Parts Manufacturing Co., Peru, Ind.

Greenville Metal Products Co., Greenville, Pa.

All correspondence addressed to

S. H. PENFIELD

General Sales Mgr.,

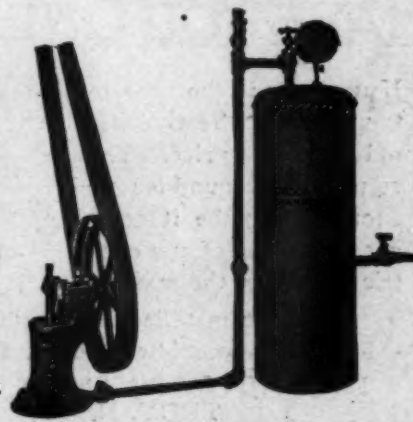
JAMESTOWN, N. Y.

AIR
COMPRESSORS
FOR
PRIVATE & PUBLIC
GARAGES
SINGLE & DOUBLE
CYLINDER
AIR OR WATER
COOLED TYPES

JACOBSON MACHINE
MFG. CO.

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HASTINGS & ANDERSON CO.
CHICAGO, ILL.
Western Representatives



Kingsston IGNITION DEVICES

RELIABLE, DURABLE, ECONOMICAL.

For ten years we have been making magnetos, coils, switches spark plugs and other ignition devices that have always given satisfaction.

Our experience may be valuable to you.
Let us help you solve your ignition problems.

KOKOMO ELECTRIC CO., KOKOMO, IND.

Know the time all the time when driving. Get the

TIME CLUTCH

It keeps the time of day right where you can see it without taking your eyes off the road for an instant. It can be attached to any steering wheel and takes any man's watch. Watch can be inserted and removed instantly. Let us send you one and if it is not satisfactory, return it and we will refund your money.

TIME CLUTCH: Nickel, \$1.00; Polished Brass, \$1.00; Gun Metal, \$1.50. VIBRATION-PROOF WATCH, guaranteed for 1 year: Nickel, \$1.50; Gun Metal, \$2.00. Sent postpaid upon receipt of price if your dealer cannot supply you.

THE STERLING MFG. CO., Inc., Staunton, Virginia

OUR SPECIALTY

The manufacture of hardened and ground steel parts.

Emergency orders given special attention.

May we send samples of our work? Let us have your prints for estimating.

THE STERLING MACHINE CO.

NORWICH, CONN.

Light Trucks in Demand

Indications point to only 30,000 commercial cars as the output for 1912, yet the market is larger and surer than the pleasure car market. Insure your dividends by offering a light four cylinder truck—¾ to 1½ tons—equipped with the

Beaver "Four" Unit Power Plant

Its long stroke (3¼ x 5 inches), large valves and liberal dimensions make it especially desirable because of its power at low speeds and its ability to stand up under hard use. Enclosed valves, gears and fly wheel give the finished appearance, quiet and cleanliness that are characteristic of the most advanced commercial cars. Write for catalog of other motors and prices.

BEAVER MFG. CO., 2900 First Ave., MILWAUKEE, WIS.

CONNECTICUT

SHOCK ABSORBERS



SECTIONAL VIEW.

"Make Every Car
a Parlor Car"

Send for Catalog No. 73

CONNECTICUT
Shock Absorber Co., Inc.
MERIDEN, CONN.

HAVE YOU ONE

If not now is the time to try the most effective signal at a low price. The volume of its sound is loud enough to make it compare with that of any electric signal on the market.



"The Warning
Courteous"

Can be installed in 15 minutes.

Furnished complete, \$5.00 or \$7.00.

TROY AUTO SPECIALTY CO.
TROY, N. Y.



All That is Practical

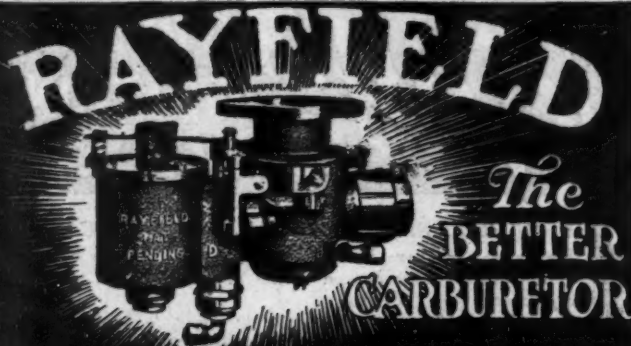
CAN BE DONE ON THE M. A. C. STEAM VULCANIZER

Your shop boy can make \$1.00 each hour repairing inner tubes—relining casings—and vulcanizing surface cuts on casings. The M. A. C. is portable—compact—low in cost. Used where needed in shop or street.



MOTOR APPLIANCE CO.

1304 Bellefontaine
Indianapolis Indiana



FINDEISEN & KROPF MFG. COMPANY,
21st and Rockwell Streets, CHICAGO

HANG ON TO YOUR OLD TIRES
THEY CAN BE USED FOREVER
WHEN COVERED WITH
STEEL



The KIMBALL STEEL PROTECTOR makes BLOW OUTS, PUNCTURES, and RIM CUTS impossible. A few sections will hold any old blowout. Tires are as flexible as ever. Send for detailed information.
KIMBALL TIRE CASE CO., 171 Broadway, Council Bluffs, IOWA

The Prest-O-Lite Co.

manufacturers Prest-O-Lite, "The Light Universal," Prest-O-Starter, that eliminates the crank; Prest-O-Tire Tubes, that displace the pump; Prest-O-Tire Tanks; Prest-O-Carbon Remover and the Prest-O-Welder. Ask for information and literature for any or all of them.

The Prest-O-Lite Company
234 East South Street
INDIANAPOLIS, INDIANA

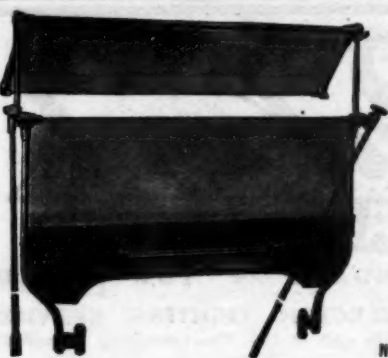
Food for Autos

Lubrication is to the motor car what nourishment is to the human body. Both require the proper diet to do their best work. Each of the many

Dixon Motor Lubricants

is carefully prepared to meet some particular need of the motor car, and fill that need as only a flake graphite lubricant can. Write for free sample and booklet No. 3-G.

JOSEPH DIXON CRUCIBLE CO.
JERSEY CITY, N. J.



They are better than any other shield made by anyone.

Used as regular equipment for 1912 by Peerless Motor Car Co.

F. B. Stearns Co.

Insist on your car being equipped with a **BANKER**

Being "Tailor-made" they will fit your individual car.

NOT HOW CHEAP, BUT HOW GOOD

Banker No. 6 Rain Vision with Ventilator

WRITE FOR CATALOG.

Banker Wind Shield Co., Pittsburg, Pa.

Price
without
Gauge
\$4.00

ATLAS
AUTO
PUMP

Price
with
Gauge
\$6.00

Made by Bridgeport Brass Co.

YOU MUST have a reliable Pump—
a pump that inflates your tires easily and quickly and with little effort. The ATLAS pump is guaranteed. If your dealer doesn't carry it we will send the ATLAS prepaid on receipt of price.

BRIDGEPORT BRASS COMPANY
102 Crescent Avenue :: Bridgeport, Conn.



10,000 Miles

WITHOUT A SINGLE REPAIR OR ADJUSTMENT.

This is one of the many good records made by the

Briggs & Stratton Igniter

It Sparks { Every Cylinder
Every Time
At Every Speed

The customer who made this 10,000 miles did not touch his igniter except to clean the platinum points twice. He used no other ignition, and his igniter is just as good to-day as the day he bought it.

It will run a car 2 to 3,000 miles on one set of dry batteries or one charge of a storage battery. Write for Catalog.

Briggs & Stratton Co. 270 Milwaukee, Wis. Milwaukee St.

The GASIFTER



The Gasifter acts as a gasoline sifter by passing the vapor and air mixture forcibly through four different brass screens, then thoroughly sifting and breaking up the globules of gas and delivering at the cylinders.

A perfect gas mixture of even density at all speeds. The Gasifter has no revolving parts and is the most simple and efficient accessory ever put on the market. It keeps the engine clean, fouling of valves is prevented on account of the perfect mixture produced by the Gasifter.

It also insures extra mileage to the gallon.

Made in many sizes to fit all makes of cars. Easily attached. Sold for \$2.00. Send for Booklet.

THE TOLEDO AUTO DEVICES CO.
710 GARDNER BUILDING, TOLEDO, OHIO

TIRE PROTECTION WITH A GUARANTEE

(OF)

~10,000 MILES~

Write for our guarantee, and catalogue,
"The Enemy of Tire Expense"
Please give dealer's name.

BRICTON MFG. CO.

2121 Brickson Bldg.,

Brookings, S.D.

**Corcoran
Lamps**

GAS, OIL, AND ELECTRIC

CORCORAN LAMP CO.
CINCINNATI, OHIO

American AXLES



Write today for our Booklet.

AMERICAN BALL BEARING CO.
CLEVELAND, OHIO

EVIDENCE

proves this case—all blow-outs and 90% of punctures in Automobile Tires can be prevented with

Auto Puncture- Proof Casings

We have facts to prove this. Try a set of these casings. If they do not eliminate all blow-outs and 90% of punctures, you can have your money back.



Write for Booklet "How to Reduce Your Tire Expense."

**STATES
MFG. CO.**
1027-1035
W. Adams Street,
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Swinehart Tires

Investigate Swinehart Tires—pneumatic and solid truck types—and you will understand the loyalty of the vast army of car owners to whom Swinehart spells the maximum of tire service, tire mileage, tire economy.

The Swinehart Tire and Rubber Co
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Branches and Distributing Agencies in All Principal Cities

Packard CABLE

IS THE STANDARD OF THE WORLD
FOR

IGNITION and ELECTRIC LIGHTING SERVICE

The choice of all users and of the discriminating manufacturers.

A distinct line for each requirement.

Want samples?

The Packard Electric Co., 302 Dana Ave., Warren, O.

BEST FOR YOUR ENGINE!

HARRIS OILS

TRADE MARK—REG. U. S. PAT. OFF.

are good lubricants. The soot deposit elements are eliminated to the greatest possible extent. HARRIS OILS last longer because they have "body." They reduce friction and flow freely.

A. W. Harris Oil Company

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Hubs — Rims — Jackshafts

After thirty years of progress and growth we now have the largest axle plant in the world. The best materials—best equipment and best manufacturing methods must mean the best products.

Factory at Flint, Mich.

**WESTON
MOTT CO.**

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"A NATURAL CARBURETOR"

Information furnished on application

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Reichenbach Laboratories Co.
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THE GIBNEY ELECTRICK VULCANIZER

Complete
with
repair
kit
\$15⁰⁰



Write for
Our
Booklet on
Care of
Tires.

JAMES L. GIBNEY & BRO.
215 N. Broad St., Philadelphia, Pa. - 248-52 W. 54th St., N.Y.

The Searchlight Gas Co.

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Still in business and growing every day. More and more an *inspiration*. Watch us grow.

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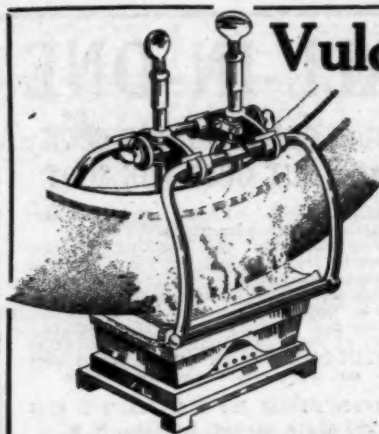
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Heinze Ignition

MAGNETOS
TIMERS
COILS
SPARK PLUGS

CATALOGUE A SENT ON REQUEST

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Vulcar \$12.50

A New Process for repairing tires and tubes. The only portable vulcanizer which moistens rubber while being vulcanized. The only safe vulcanizer for the novice. Any boy can operate it. Send for free book.

**The New Process
Vulcanizer**

2222 Monroe St., Toledo, O.



AJAX TIRES

"Guaranteed 5000 Miles"



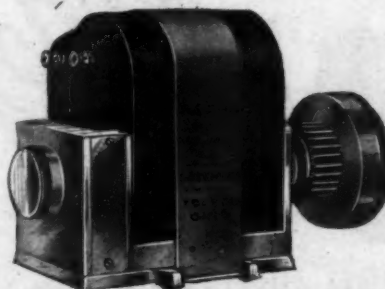
The Best Touring Tires in the World

The equipment on the four Trophy
Winning Cars in the
GLIDDEN TOUR

AJAX-GRIEB RUBBER COMPANY

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The Light That Always Shines



Electric light equipment for automobiles that is one-third more efficient for one-third less money than any other lighting system.

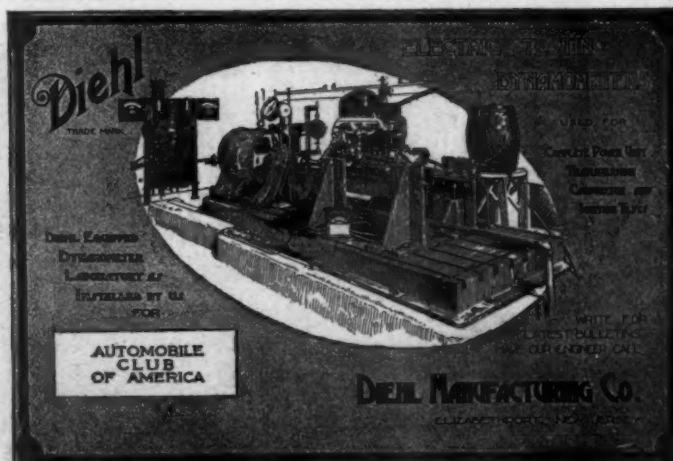
The Electric Auto-Lite Co. 135 Michigan St.
Toledo, Ohio

Diamond Tires

We could build them cheaper
But We Won't.

We would build them better
But We Can't.

The Diamond Rubber Co.
Akron, Ohio



All Who Can Afford It Use The WARNER AUTO-METER

The "Aristocrat of Speed Indicators"

THE man who takes pride in his car is the one who appreciates the Warner most. He would never disgrace it with anything cheap, inferior and unreliable.

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GAS—ELECTRIC—OIL

Pleasure and Business Car Types
Modern Designs Durable Build

R.E. DIETZ COMPANY

60 LAIGHT STREET

NEW YORK CITY

ESTABLISHED 1840



Type C

The CASGRAIN SPEEDOMETER

SOLD ON A POSITIVE GUARANTEE PROTECTING the buyer at every possible angle, and we back our faith and experience in this matter by offering to put one on YOUR car.

ON THIRTY DAYS' FREE TRIAL

Write to-day for full particulars.

CASGRAIN SPEEDOMETER

NEW YORK, 1919 Broadway
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BUFFALO, N. Y., 37 to 39 Court Street

NO MORE SOOT IN
YOUR SPARK
PLUGS IF YOU USE



\$1.50
EACH

ALL-IN-ONE

JUST OPEN THE STOP-COCK
AND OUT GOES THE SOOT

ALL-IN-ONE SPARK PLUGS have numerous other advantages.

You can stop any knocking in your motor by priming here with a few drops of kerosene.

You can instantly find any missing cylinder by turning the pet cocks.

You can instantly prime your motor.

All of these advantages are contained in ALL-IN-ONE SPARK PLUGS, and they cost no more than the other kind.

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ASK FOR THE
FAMOUS



Mea

MAGNETO

Our Guarantee

A MEA makes cranking easy and safe with spark fully retarded and also increases power and flexibility of motor.

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STA-RITE
"STAYS RIGHT THE LONGEST"

PERPETUALLY
GUARANTEED

We agree to place in as good working order as when new any STA-RITE Ignition Plug AT ANY TIME when returned prepaid to our factory. Just send the old one with 5c. postage for return.

POSSIBLE ONLY WITH STA-RITES. RESULT OF TEN YEARS' EXPERIENCE.

The patented double porcelain positively prevents cracking. The outer cap completely protects the inner heated part.

Cheapest for Owners—Least Trouble for Drivers—Best Sellers for Dealers.

Price of any style STA-RITE Plug, \$1.00.

We Make STA-RITES for any style engine. Mention the engine and we'll send you a plug adapted for it.

THE R. E. HARDY CO. (Inc. 1900), 1134 Austin Ave., cor. May St., Chicago, Ill.

We Are the Largest Manufacturers
in the United States, of
WOOD BOXES
FOR HOUSING COILS AND MAGNETOS

Thoroughly kiln-dried Oak, Mahogany, Circassian Walnut, Black Walnut and Birch Lumber always on hand. Will gladly quote from samples or Blue Prints without obligation to you. We are ready to close contracts, large or small, guaranteeing material, workmanship and deliveries, all kinds of Special Cabinet Work on contract.

THE WABASH CABINET CO.

WOODWORK MANUFACTURERS

WABASH, IND.

Woodworth

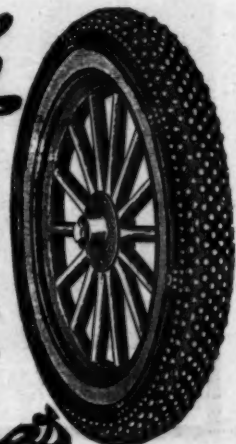
WOODWORTH TREADS are the only true tire protectors. They never chafe or heat the tires. They are held in place by coil springs along the sides, which automatically take up all slack and prevent any looseness. The protector is always tight and smooth.

No other protector can be fitted in the way that these automatically fit themselves.

They fit all makes of tires—anyone can easily put them on. Send for Catalogue.

Leather Tire Goods Co., Niagara Falls, N. Y.

Canadian trade supplied from Niagara Falls, Ont.



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ELEKTRA
ASBESTOS FRICTION**For BRAKES
and CLUTCHES**

Over 1,000,000 feet of material produced by our PATENTED PROCESS in daily use.

High coefficient of friction gives greatest factor of safety in operation of all brakes and clutches and OUR PATENTED PROCESS produces the only HIGH-FRICTION facing. THIS MATERIAL gives better satisfaction and wears longer than any other facing and is especially adapted for manufacturer's use; our BAND linings, as well as RINGS and CONES for CLUTCHES being formed ACCURATELY to shape and size.

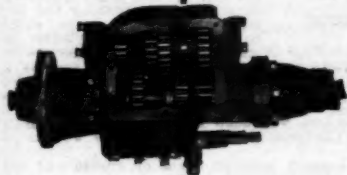
F. L. Horton Manufacturing Co.
36 Whittier St., Boston, Mass.

**SHELDON AXLES
SPRINGS**

THE SHELDON AXLE CO.
WILKES-BARRE, PA.

CHICAGO OFFICE:
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COVERT**TRANSMISSIONS**

are the very best for hard, exacting service.

Our construction has been approved by leading engineers. Every gear is of nickel steel, carbonized and heat treated.

Covert Transmissions will remove all doubt about the efficiency of that part of your car

**COVERT MOTOR
VEHICLE COMPANY**

Sales Office: Ford Building,
Detroit, Mich.
Factory: Lockport, N. Y.



The superiority of

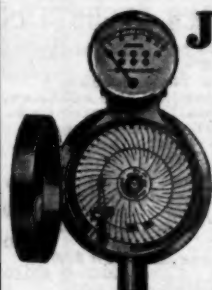
**SCHAFER
BALL BEARINGS**

is conclusively proven by
the fact that they are used

in the leading cars throughout the world.

BARTHEL, DALY & MILLER

42 Broadway, New York City.



Jones Recorder

JONES RECORDER

Gives time, speed and distance. Number of stops—length of each stop. Complete record of every movement or stop of vehicle marked on chart. Absolutely essential to all operators of motor trucks or delivery wagons.

The Jones Recorder consists of a strong brass casing, containing a clock work and flexible shaft from the drive wheel of the vehicle.

The Jones Recorder
Broadway and 76th Street, New York

Stewart
GAS SAVER
(An Auxiliary Air Device)
Saves up to 40 per
Cent in Gasoline
SEND FOR LITERATURE
Manufactured by
Alfred C. Stewart Machine Wks. 1008 Santee St.
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ELECTRIC SIRENO HORN
PATENTED

A Motor Car Without a Long Range Warning Signal is Like a Railroad Locomotive Without a Whistle

The SIRENO is a Long Range Warning Signal—the "Mile-Ahead Horn." Its peculiar piercing note of wonderful penetrating power always demands the right of way.

The SIRENO is electric—that means instant response at the will of the driver—it never fails. It is operated by any battery—dry or storage.

The SIRENO is manufactured in several styles and sizes, and we would suggest that you write for additional information.

The SIRENO Company 1600 Taylor Bldg.
New York City

**TIRES THAT
NEVER
TIRE**

The auto-
let's dream
realized at last:
"Tires That Never
Tire." With your car
equipped with this won-
derful device, you can for-
get all about tire trouble and
enjoy motoring as you never did
before. No need for extra tires. No
delays with tire trouble. Tire expense
reduced to the minimum. Cost Nominal.
Service Phenomenal. Agencies are being
established in all cities and towns. Good
territory still open. Write us at once.

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Lock Box 678 A Angola, Indiana, U. S. A.

TIRE TROUBLES

have no terrors for users of

AUTO INNER CASINGS

Reduce mileage cost 50%

We publish a valuable little booklet
"The Care and Wear of Tires"
which we will send FREE on request.
Write today and learn something about tires.

Western Automobile Supply Co.
3900 Sheridan Road Chicago, Illinois

The indisputable **EFFICIENCY, ACCURACY** and
SILENCE of

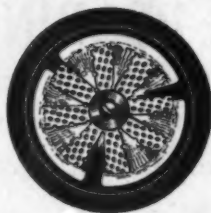
WARNER TRANSMISSION DIFFERENTIAL and STEERING GEARS

are sufficient evidence of the
SUPERIOR METHODS and **FACILITIES** for
producing a **HIGHLY REFINED PRODUCT**

WARNER GEAR CO.
MUNCIE, IND.

GYREX

THE MIXER



Price, \$3.00

Saves 10% to 25%

gasolene. Fits intake
pipe. Spins around at
great speed and "mixes
the mixture." We send
it to you on trial.

If not satisfactory your
money is cheerfully re-
funded.

THE ROYAL EQUIPMENT COMPANY
420 Housatonic Avenue BRIDGEPORT, CONN.



(Patent Allowed)

get at least one of these devices and use it occasionally in keeping your
engine free from carbon, the greatest foe to the life, power and speed of
engines. Don't let the carbon accumulate and don't get the "remover" that
is a "cure" worse than the disease. Order from your dealer "the little soft
chain" but if he cannot supply you, we will send it postpaid by return mail.
PRICE 75¢. Three for \$2. (You can clean two cylinders at the same
time with two chains.)

Made of tough soft wire (90% copper) with no edges or angles and cannot
cut or scratch.
Always state kind of motor when ordering.

E. S. MICHENER, East Washington Street, NEW CASTLE, PA.

Here's a Carbon Remover

Which will thoroughly
clean a cylinder—top,
sides and piston head—in
two minutes.

Avoid the time and expense
consumed in tearing down the
motor with the incidental dis-
turbance of the adjustments—stop
scratching and nicking the metals
with sharp edged tools, stop in-
candescence on the cylinder head,
smoke and engine deterioration—

use it occasionally in keeping your
engine free from carbon, the greatest foe to the life, power and speed of
engines. Don't let the carbon accumulate and don't get the "remover" that
is a "cure" worse than the disease. Order from your dealer "the little soft
chain" but if he cannot supply you, we will send it postpaid by return mail.
PRICE 75¢. Three for \$2. (You can clean two cylinders at the same
time with two chains.)

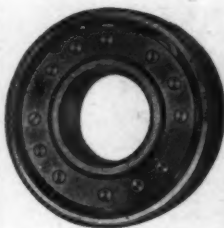
Made of tough soft wire (90% copper) with no edges or angles and cannot
cut or scratch.
Always state kind of motor when ordering.

E. S. MICHENER, East Washington Street, NEW CASTLE, PA.

Bower Roller Bearing Company

DETROIT, MICHIGAN

Manufacturers of



HIGH GRADE ROLLER BEARINGS

FOR ALL PURPOSES

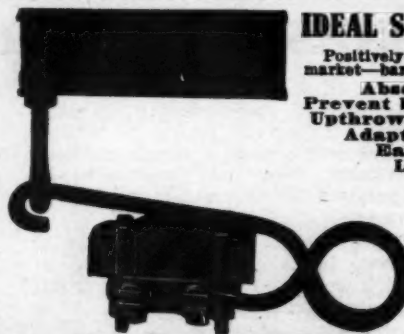
Our Consulting Engineering Depart-
ment is always at your service.

Send for catalog, price-list and speci-
fication sheets of sizes

IDEAL SHOCK ABSORBERS

Positively the best Absorbers on the
market—bar none.

Absorb the shocks.
Prevent bumping the springs.
Upthrow positively stopped.
Adaptable to any car.
Easily attached.
Last forever.



Ideal Shock Absorbers

Special on Ford Model T. Representatives wanted in unoccupied territory.
For sale by garages and dealers or directly by

AMERICAN SALES CO. (Exclusive Agents) 1690 Mt. Elliott Ave., Detroit, Mich.

Prices	Full Set	Rear Only
For cars under 1500	\$18.00	\$12.00
For cars 1500 to 2500	\$24.00	\$16.00
For cars 2500 to 3500	\$30.00	\$20.00
For cars over 3500	\$40.00	\$28.00

Sold on positive guarantee of
satisfaction or money back



TRADE MARK

MR. MANUFACTURER

You have trouble in hold-
ing paint on your steel, iron
and woodwork and in pre-
venting checking, fading and
loss of gloss, and never have
had the service from your
paint that the expense would

lead you to expect. As a baking material, it is perfect.

FLEXIBLE COMPOUND IS

Rust Proof
Water Proof
Acid Proof

{Absolutely}

Weather Proof
Flexible
Perfect

The above statements are TRUE and we CAN PROVE THEM.

If interested our representative will call and make a practical demonstration.

JOS. M. BROWN & CO., Distributors

Great Northern Building

CHICAGO, ILL.



Long Radiators

THE LATEST DEVELOPMENT
IN

High Grade Radiators

THE LONG MANUFACTURING CO.
Detroit, Mich.

Warren MOTOR CARS

A snappy, progressive line that shows red blood and live ideas. Compare and you will see why the Warren wins.

"12-30" Roadster - - \$1175
"12-30" Demi-Tonneau - 1250

Including Top and Automatic Windshield.
Self-Starter, \$50 extra.

"12-30-K" Touring Car - \$1300 - "12-35" Roadster - \$1415
"12-35" Touring Car - \$1500 - "12-40" Touring Car - \$1700
Including Self-Starter, Automatic Windshield, Silk Mohair Top, etc.

Warren Motor Car Co. 391 Holden Ave., Detroit, Mich.

WINTON SIX

Consider Changing Conditions

There is more reason for buying cautiously right now than ever before in automobile history. "Consider Changing Conditions" gives the inside facts.

Shall we send you a copy?

The Winton Motor Car Co.

422 Berea Road

Cleveland, O.

ALUMALOYD

RUST-PROOF

SHEETS

Make possible the all-metal car. Light in weight with the strength of steel. The ideal material for bodies and all sheet metal parts. Takes a high finish with little labor. Get full details.

The Alumatoyd Products Co.
Canton, Ohio

R-C-H "Twenty-Five"

5-Passenger Touring Car

\$850 Fully Equipped
F.O.B. Detroit

All and more than you'd expect in an \$1800 car. See it for yourself.

Write for folders. Dealers better wire.

R. C. HUPP, Manufacturer

Distinct from and having no connection
with the Hupp Motor Car Company

100 Lycaste St.

DETROIT, MICHIGAN

KISSELKAR

Kissel Kars maintain the reputation as the conspicuous automobile values in America today—Six cyl., 60 H.P., \$3,000—fully equipped; Four cyl., 50 H.P., \$2,350; 40 H.P., \$1,850; 30 H.P., \$1,500. Write for free portfolio.

Kissel Motor
Car Co.

122 Kissel Ave., Hartford, Wis.
Branches and agencies everywhere



Every inch a car

McFARLAN

Six Cylinder, Self Starting

2 Models. Fully Equipped.

40 — 45 H. P. \$2,100.00

55 — 60 H. P. \$2,750.00

Ask for full information. Territory open for live dealers

McFarlan Motor Car Co., Connerville, Ind.

WILCOX TRUX

Are built so the driver's cab can be entirely closed in cold weather. This allows the driver and truck to work regularly, regardless of weather.

The less you know about trucks, the more you need a good truck. The more you know, the more you'll appreciate Wilcox Trux. Ask for catalog.

H. E. WILCOX MOTOR CAR CO.

1042 Marshall St., N. E.

Minneapolis, Minnesota

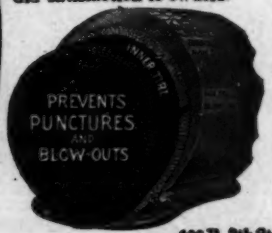
No Need to Buy New Tires THIS Fall

Make your old ones last the season by using **THE INTERLOCK INNER TIRE**. The HEAVIEST, STRONGEST and BEST reinforcement made—contains largest number of plys. Prevents PUNCTURES, BLOW-OUTS, tube PINCHES. Strengthens the WHOLE tire, especially good to reinforce casings that are rim-cut or weak along sides. Double-Fabrics have 5 years successful record—thousands in use, giving splendid satisfaction to owners.

The Interlock Inner Tire has MADE GOOD. We want Live Dealers and Agents to handle it in cities and districts. Our proposition is RIGHT—write for it to-day. Booklet and sample section free to owners giving name of Supply Dealer.

DOUBLE-FABRIC
TIRE CO.

106 E 7th St., AUBURN, IND.



Please mention The Automobile when writing to Advertisers

If there is no Pullman agency in your territory Let Us Hear From You At Once

Our 1912 line includes the famous Pullman "4-30," "4-35," "4-50" and our two big leaders, the "4-40" and "6-60." The equipment on the last three models includes self-cranking motor, electric lighting device, top, windshield, speedometer, foot and robe rails, etc.

Pullman cars "lead the leaders." Some of our agents sell as many as 200 Pullman automobiles each year. Let us put you in touch with our agents and find out for yourself why Pullman agents are always good agents.

"OUR OFFER." If there is no Pullman agency in your territory we will arrange to "show you" at absolutely no expense to you.

PULLMAN MOTOR CAR CO. 238 N. YORK, PA.
GEORGE ST.

BRODESSER MOTOR TRUCKS

Built for Service

have made good throughout the five years
past and our first trucks are still running

CAPACITY 1 TO 3 TONS

Brodesser Motor Truck Company

SALES DEPARTMENT

Harvester Building Michigan Ave., Chicago, Ill.

AGENTS: We will offer desirable selling connections to a few energetic, reliable agents.

At
Madison
Square
Garden



Back of Every Corbin Car

stands an organization with fifty years of successful manufacturing and commercial experience, ample capital, a thoroughly equipped and up-to-date plant, and the determination to keep every customer satisfied.

Model "40" at \$3,000

Model "30" at \$2,000

Complete description of 1912 models in Catalogue E. Write for it.

Corbin Motor Vehicle Corporation
NEW BRITAIN, CONN.

Franklin "Little Six"

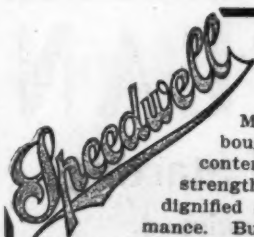
30 HORSE POWER \$3500

Six cylinders in a small car—
that is the story

A small six-cylinder car. Beautiful
in design and proportion. Franklin
quality throughout.

A five-passenger car. Fully equipped.

FRANKLIN AUTOMOBILE COMPANY Syracuse N Y



\$2500 to \$2900

More than this car offers cannot be bought. It concedes nothing to its costliest contemporary in structural soundness and strength, in luxury, in ease and comfort, in dignified appearance, or in satisfactory performance. But brings you notable features of design and build that are peculiar to itself.

**Speedwell Motor
Car Company**

10 Essex Avenue
Dayton, Ohio



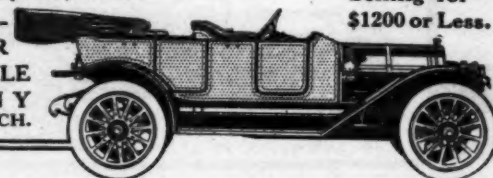
Model 12-H—\$2500.
Standard chassis of all Speedwell models
has 123-inch wheel base and 50 H.P. motor.



Cost Less per
Horsepower
and per
Wheel Base
Inch than
Any Other
Automobile
Selling for
\$1200 or Less.

Furthermore, they excel equally in the general excellence of design, workmanship and finish.
They are the equal, and in many points the superior, of most cars selling for \$3,000 or \$4,000.
Send for our Table of Comparative Motor Car Values. It will make you a posted purchaser.

**CLARKE-
CARTER
AUTOMOBILE
COMPANY**
JACKSON, MICH.



THE ULTIMATE CAR
(KNIGHT TYPE MOTOR.)

The first American Car to adopt the Silent
Knight Motor—the Engine used by Daimler
Mercedes, Panhard and Minerva

THE F. B. STEARNS CO.
CLEVELAND, OHIO

Branches: New York, Pittsburg, Atlanta,
Minneapolis and San Francisco

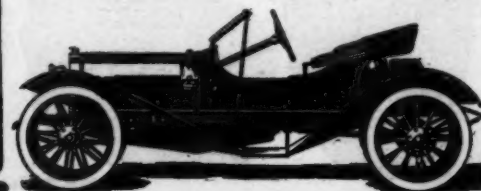


THE UNION "25" \$650

"Made a Little Better Than Seems Possible"

25 H.P., 4-cylinder motor, Bosch magneto, Schebler carburetor, Wheelbase, 100 inches. Equipment regular, includes 3 oil lamps, tools, pump, jack, tire repair kit and horn. We furnish top windshield, trunk, gas lamp and generator for \$50.00 extra. Write for Literature.

UNION SALES CO., 61 E. Spring St., Columbus, Ohio



AMPLEX VALVELESS SELF-CRANKING MOTOR

No Valves

No Sliding Sleeves

The Amplex valveless motor receives its gas, explodes its gas, discharges its gas and delivers its power with one upward stroke and one downward stroke only. Each power stroke is completed after two movements only of the piston.

Write for AMPLEX EDUCATION, which fully illustrates and describes the entire construction.

Simplex Motor Car Co.
Mishawaka, - - - Indiana

E-M-F "30" FLANDERS "20"

The cars that have made the
high price automobile a fad

E. M. F. CO., Automobile Manufacturers
DETROIT, MICH.

1912

The highest grade car on
the market regardless
of price.

KLINE CAR

\$1750 \$2250
\$2850 \$3600

1912

Complete specifications and
catalogue upon request.

Kline Motor Car Corporation
RICHMOND, Va. YORK, Pa.



Motor Cars
New England's
Best Product

Built in three chassis models
with ten different body designs.
Advance information sent on request.

AUTOMOBILE CO.

Springfield, Mass.



YOU might be able to pile onto a car more extravagance, but you can't pile into it more all-around efficiency than found in the 40 horsepower Ohio. By "all-around efficiency" is meant ability to meet all the requirements ever exacted of an automobile and to meet them just a little better than expected of highest priced cars. A glance at the specifications and then at the price will convince you that the Ohio offers its owner greater motor value than ever before obtainable.

A Little Territory Still Open for Aggressive Agents. Send for Catalog No. 52.
\$2,150 Ohio Motor Car Company \$3,350
Elmwood Station - Cincinnati, Ohio

Motor Car Manufacturers
Since
1893

HAYNES

1912

Occupying the newest and most modern automobile
manufacturing plant in America.

HAYNES AUTOMOBILE COMPANY
Dept. T-7 KOKOMO, IND.



—a thousand speeds—one lever control—will climb a 50% grade. Pleasure cars and light delivery vehicles.

Write for facts.

Cartercar Company, Pontiac, Michigan

Jackson
UNIT POWER PLANTS
KEEP OIL IN AND DIRT OUT

Model 52 - \$1800
Model 42 - \$1500
Model 32 - \$1100
Model 26 - \$1100
Model 28 - \$1000

1912 MODELS NOW READY

**Jackson
Automobile
Company**

1208 East Main St.
JACKSON, MICH.



The Borland Electric Brougham, the car that heads the list of Chicago Electric Car sales will be on display at the Coliseum, Chicago, during the National Association of Automobile Manufacturers Exhibition, January 27th to February 3d, 1912. A connection is desired with a few successful agents who will appreciate what we have to offer in the way of quality, price, service and the best selling plans in the business.

THE BORLAND-GRANNIS CO.,
2634 Michigan Avenue Chicago

SCHACHT

For four years our "3 IN 1" cars have been the most satisfactory and popular low-priced cars on the market. Their easy convertibility from runabout to touring car or delivery wagon gives them a unique advantage over any other car in their class. They offer you the best chance to cover this wide and profitable field. Write today for Catalogue.

THE SCHACHT MOTOR CAR CO. 2821 Spring Grove Ave.
CINCINNATI, OHIO

THREE
CARS
IN
ONE



8⁰⁰
\$5⁰⁰

CROW "ELK-HART"



The cars that were built to set a new high-water mark in Automobile values.

12 models for 1912.

CROW MOTOR CAR CO.
ELKHART INDIANA



THE AUTOMOBILE CATECHISM (Revised Edition). The One Best Book for Car Owners. The demand for this most comprehensive work has encouraged its publishers to produce in this edition a work filled with terse, plain information, covering every possible question which may arise in your automobiling experience. Its scope has been broadened, its size has been more than doubled, its fund of information has been enlarged. Briefly—The Automobile Catechism treats of the automobile in modern form and of all of its troubles that may be remedied by the driver. It asks the question—then answers it. Size, 5 inches by 7½ inches (convenient pocket size). 264 pages (gold edged). Flexible and handsome morocco binding (gold letters). Price, \$2.50, prepaid. Send your order to-day. We will ship the day order is received. THE AUTOMOBILE, 231-241 W. 39th St., New York.

The Pioneer Moderate Priced
Six-Cylinder Car

Havers
Self-
Starting
"Six-44"



Price
\$1850

The Havers Motor is of the Six-Cylinder, 4-cycle long-stroke type; 44 H. P.; Bosch Magneto; dual system; Model "C" Stromberg Carburetor. 122-inch wheelbase, 36x4-inch wheels; Presto starter. Springs, semi-elliptic front, platform suspension, rear; rear axle, full floating type.

Full specifications sent on request.

Havers Motor Car Co., 2770 28th St., Port Huron, Mich.

STAVER CHICAGO

Every dealer who has taken up the new Staver Dealers' proposition for 1912, is enthusiastic about it. If you haven't heard it, write us today.



STAVER CARRIAGE CO.
76th and Wallace Streets, Chicago, Illinois

30
H P
Model L

\$1250

Colby
CARS

SELF STARTING!

EXTRA 1912 MODEL L

COLBY MOTOR CO.
MASON CITY, IOWA

40
H P
Model H

\$1750

THE SELDEN CAR

ONE CHASSIS—FIVE BODY STYLES

Range of prices from \$2500 to \$3750
Full floating rear axle—multiple disc
clutch—electric lights on all cars.

Extra large valves and wonderfully
efficient lubrication system.

Selden Motor Vehicle Co., Rochester, N. Y.

\$1750 Great Western \$1750
FORTY

A Leader for Comfort and Power

This 1912 detachable fore-door model is a handsome—powerful—economical car. Handbuffed leather upholstery—beautifully painted and completely outfitted with superb appointments. Write for catalogue.

GREAT WESTERN AUTOMOBILE CO.
PERU, IND.

SELF-PROPELLED VEHICLES. By J. E. Homans. An excellent book treating of the practical side of the construction and operation of automobiles, with full information for the novice or the experienced operator. Tells what to do and how to do it. Describes in detail the mechanism of a modern car and explains the functions of each part. Forty-four chapters of good sound information for those interested in automobiles. This book contains 672 pages and over 500 interesting illustrations and diagrams. Size, 5 1/4 inches by 8 1/4 inches. Printed on fine paper and substantially bound in cloth. Delivered, \$2. Address THE AUTOMOBILE, 231-241 W. 39th St., New York.



"Quality of a Master"

LENOX CAR

The best that money can buy
\$1800—Fully Equipped

AGENTS WHO KNOW WANTED IN OPEN TERRITORY

Lenox Motor Car Co., Boston, Mass. { 3368 Washington St.
 16 Columbus Ave.

TRUCKS AND DELIVERIES

BEST AND CHEAPEST
ALL SIZES AND FOR
ALL PURPOSES

AGENTS
 DESIRED



CHASE MOTOR VEHICLES

Selected by the Big Ones Who Know

Q Because their simplicity, durability, economy and efficiency have been thoroughly demonstrated.

Because their mechanical excellence appeals to men who **KNOW HOW** a motor wagon should be built.

Their use means a better delivery service at a much less cost. Send for facts and real figures of operating costs. Catalogue **FREE**.

CHASE MOTOR TRUCK CO 90 Wyoming St., Syracuse, N. Y.

The Decatur Hoosier Limited

1-1 1/2 TON TRUCK

This truck, which is in the service of the Henry Siegel Co. of Boston, Mass. has travelled six thousand miles on the original set of pneumatic tires, without repairs or expense of any kind to the truck.



The purchase of a second truck by the Henry Siegel Co. proves that the service received from the Decatur Hoosier Limited Truck has been absolutely satisfactory. We are doing the same thing for other concerns in twenty different lines of business. We can do the same for you. Write for particulars and catalog.

Decatur Motor Car Co.

Manufacturers

Decatur Indiana

Eastern Branch Office
 20 Green Street
 Cambridge, Mass.

The Sturdy Stutz

The Car That Made Good in a Day—
Now Makes Good Every Day

Complete motor car service is assured in every Sturdy Stutz Car. The Stutz record in racing is one of consistency, showing that the car has been properly designed—and carefully manufactured. Send for catalogue A1, showing models we manufacture.

Some productive territory open to dealers.



Ideal Motor Car Company

Manufacturers of Stutz Cars

Indianapolis, Indiana

Stutz cars will be exhibited at Grand Central Palace Show, New York and at the Chicago Show.

Lexington **\$1775**



Rutenber Motor, Bosch Magneto and 4 Unit Coil & Spark Plugs, beats any dual system; Self Starter, Warner Mfg. Co. Transmission, Timken Axles, 118" Wheel Base, 4x34 Goodrich—Goodyear—Diamond Tires, Finest Upholstery, Springs Half Front—Three-quarter Rear, Five-Passenger Car. A better car can't be found at this price.

Write for catalog.

LEXINGTON MOTOR CAR COMPANY, CONNERSVILLE, IND.

Please mention The Automobile when writing to Advertisers

CLARK 30

114 inch wheel base—32 x 3 1-2 Tires

Open Touring Car
\$1050
Torpedo Roadster
\$1050
Fore Door \$1100

CLARK 40

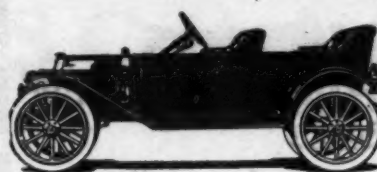
116 inch wheel base—34 x 3 1-2 Demountable Rims
Enclosed Valves. Rutenber Motor 4½ x 5½
No Deposits Liberal Contract

Open Touring Car
\$1250
Torpedo Roadster
\$1250
Fore Door \$1300

CLARK MOTOR CAR COMPANY

Shelbyville

Indiana

**K-R-I-T**

Five Passenger
Touring Car
Fully Equipped
\$900.00

Foredoor Runabout, \$800.00
Roadster, \$825.00

Agents: Some good territory unassigned

Write at once for proposition

K-R-I-T MOTOR CAR COMPANY

Department A, DETROIT

INTERNATIONAL CHAMPION**THE MARMON**

The Easiest Riding Car in the World



Winner of many of the world's greatest victories including the International Sweepstakes Race, covering 500 miles in 402 1-7 minutes at the record-breaking speed of 74.68 miles per hour.

Now when the best car in the world can be bought for \$2750 don't you owe it to yourself to buy it if you are going to invest enough money to buy any really good car?

NORDYKE & MARMON CO.

Indianapolis

Established 1851

Indiana

Sixty Years of Successful Manufacturing

This car has a More Powerful Motor and a Bigger Wheel Base for the money than any other car.

1912 New Parry \$1450

Built to make every New Parry Owner a New Parry Enthusiast.

Dealers—write for our selling plan.

THE MOTOR CAR MFG. CO.

INDIANAPOLIS, IND., U.S.A.

Marathon

Not Simply a Car
But Car Service

A good car painstakingly built from carefully tested materials. Literature and detailed information on request.

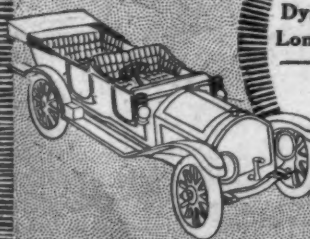
MARATHON MOTOR WORKS Nashville, Tenn.

12TH AVENUE, N. & N. C. & ST. L. RY.

General Offices, 1204 Clinton St.

METZ "TWENTY-TWO" WATER COOLED**\$495****1912 Model Completely Equipped as shown**

Four cylinder motor, twenty-two HP, valves and all moving parts enclosed and dust-proof. Chains enclosed in cases running in oil. High tension magneto ignition, 10,000 miles on set of tires. Ask for Book "J" with hill climbing guarantee. Good dealers wanted in unoccupied territory.

METZ COMPANY, WALTHAM, MASS.**COLE**

Five
Passenger Touring Car, Self-Starter;
Ward Leonard Electric
Dynamo Lighting System;
Long Stroke Motor, 4½ x 5½.
Price \$1885.

Henderson Motor
Sales Co.
Indianapolis, Ind.



Made in 3 Ton

1½ Ton Sizes**Universal Motor Trucks****"Built for Business by Business Men"**

SEND FOR OUR LITERATURE

UNIVERSAL MOTOR TRUCK CO.

502 Theodore St., Detroit, Mich.



Touring Car, \$1150
Colonial Coupe, 1400
Roadster, 950

The graceful lines of the Herreshoff—the simplicity of its motor and axles—the elimination of needless weight without sacrificing any of its strength—the low cost of up-keep—these points appeal equally to the expert and to the novice in the art of automobiling.

Write us for new catalog.

The HERRESHOFF MOTOR CO.

Detroit, Michigan



Roadster—\$950.

Farthest on a Single Charge

**Baker
Electrics**



because the Baker chassis is designed by engineers—scientifically—for the purposes of an electrically propelled vehicle—and for no other, saving utmost power.

Write for dealer's proposition

The Baker Motor-Vehicle Company
29 West 80th Street, Cleveland, Ohio

McINTYRE—1912

Cup Winner—Perfect Road score—Perfect Technical Score, in First Annual Commercial Car Contest by Chicago Motor Club, September, 1911

Pleasure Cars Commercial Cars

4 cyl. 35 H.P. 5 pass. \$ 1000	2 cyl. 14 H.P. 600 lb. cap. \$ 650
4 " 40 " " " 1250	2 " 20 " " " 950 Chassis
4 " 45 " " " 1650	2 " 24 " " " 1350 "
	4 " 35 " " " 1600 "
	4 " 40 " " " 2350 "
	4 " 40 " " " 2850 "

Builders of vehicles for forty years

We want a few more good agents. We arrange local advertising for you. We sell to dealers only.

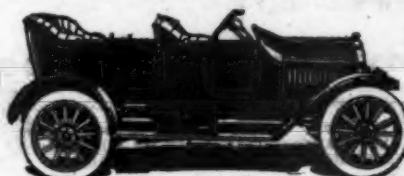
W. H. McINTYRE CO., Auburn, Indian

THE ULTIMATE CAR

THE LAMBERT

Patented Friction Drive Automobiles

Five
Exceptional
Models
1912



Five
Exceptional
Prices
1912

THE BUCKEYE MANUFACTURING CO., Anderson, Ind., U.S.A.

Moline

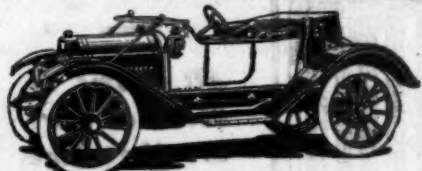
"King of the Road"

The Aristocrat of American Roadsters

This handsome, roomy, foredoor, straight line car with big artillery wheels and tires, has every desired refinement. In addition it is equipped with the famous

4x6 Long Stroke Motor

unequalled in efficiency, silence of operation and durability. While rated at 35 H. P. this motor will actually develop almost 40. The Roadster shown here is only one of the four New Models of the "Dreadnought" Moline "45." Write for Folder No. 39 showing all styles, specifications and prices.

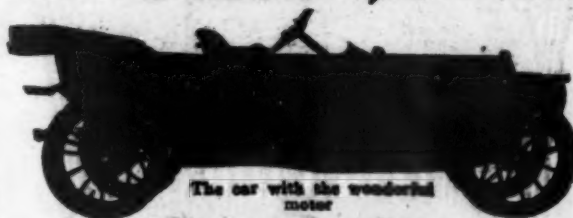


Dealers will find our latest proposition specially interesting

Moline Automobile Company
39 Keokuk Street EAST MOLINE, ILLINOIS

"THE CAR AHEAD"

1912—Pilot 40—1912



The car with the wonderful motor

36 x 4 tires, 120" wheel base.

List, \$1,650.00.

Top, Windshield and Speedometer, \$100.00 (net) extra.

Pilot Motor Car Co., Richmond, Indiana

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\$1100 TO \$2750 NINE DIFFERENT MODELS

EXAMINE HALLADAY CARS

They will stand comparison with cars of any price.

Write for our Agency Proposition.

You'll like our way of doing business.

STREATOR MOTOR CAR CO., Streator, Illinois

Dispel Ignition Mystery

The ignition on your car will be simple and plain to you if you equip with the

Remy Magneto

Day after day it performs its work faultlessly—and with a minimum of attention. (One simple outside adjustment)—and a Remy Service Station to do that for you.

See the Remy Magneto Exhibition at either the New York or Chicago shows. They are intended to make magneto ignition intelligible to you. Or, if you'll not attend, send for literature.

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The Hotel that made Lakewood Famous.

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Lakewood is one hour and thirty minutes from New York city, and for its climate, its pine trees and its wonderful dry air it has no equal.

Prospective patrons going to Lakewood will find the Hotel Lakewood one of the best managed hotels in the world.

Special inducements will be made for parties who wish to spend the season at this wonderful resort.

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The hotel will be conducted on the most exclusive lines on the American plan.

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BOWSER STORAGE SYSTEM

No garage should be without this up-to-date method of preventing loss by evaporation and danger from fire.

We make systems to fit all sizes of garages—large and small.

Pump in garage—tank outside underground—both pump and tank lock.

A meter enables you to keep a continuous record of gasolene used—no shortages.

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TO select the most successful make of car is a comparatively easy task, for none can question the right of the National to this honor. "The record of the National in 1911 was nothing short of phenomenal."

This is, in part, the tribute paid the National 40 by "Motor Age" in select-

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Harvey Herrick is selected Road Race Champion driver because of his

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The buying public knows that National cars gracefully met the severe competition of 1911 and comfortably outstripped cars of higher price. Now is the time for dealers to act on this cue and profit by the proven superiority of the National 40.

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THE NEW KAMLEE

AUTO TRUNK

is absolutely dust proof

See the
new Interlock
Edge—It makes
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air tight



The edges of drop
front and top lock
together as shown

Regular Kamlee

in sectional view at left. A rubber tub-
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irregularity or give in top and front.

Every Kamlee is fitted with two or more stand-
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removed without taking trunk from rack.

Kamlees are made to fit any car.

A waterproof covering is fas-
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spring-swivel nuts. No straps to
bother with in opening.

See the new Kamlee at your dealer's.
If he doesn't have it write for prices
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THE KAMLEE COMPANY

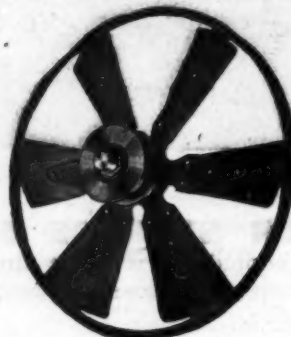
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Look for this
trade mark
on lower
right
corner of
trunk.



BY ACTUAL TEST



Patented

The Sparks-Withington One-Piece-Blade RADIATOR
FAN will deliver a greater volume of air with less H.P.
consumption than any other fan on the market. Bonafide
tests furnished to those interested.

With this assurance, and considering that we are spe-
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a saving to you.

**We will gladly test free of charge and submit
report on fans you now employ.**

Don't fail to write us when you are
ready to consider 1912 contract.

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Battery Boxes
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Hubs Complete

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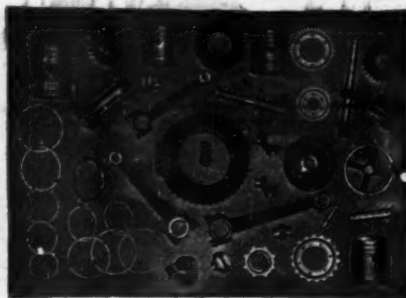
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Specialization means Superiority

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producing a large
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at a consistent
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mit estimates on
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We make a special point of Helical Cut Motor Gears, the
only correct solution of the motor gear problem, and Integral
Cam Shafts, with Cam Contours ground after hardening.

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claiming it to be Monamobile Oil—that is to see with your own eyes
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use comes. Thousands have learned that ordinary oil fouls a motor—
that we guarantee Monamobile Oil to run a car a whole season
without fouling the engine.

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Monamobile Oil is the finest engine oil it is possible to make—com-
pounded by experts—the great non-fouling oil—which holds to the sur-
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oil on the oil market—costs the user no more than so-called first-class oil.
Although it costs the dealer more money than other oils, he can sell it
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for our proposition now.

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The Most Powerful Car of Its Size in the World

Such is the distinction which individualizes the CINO, a car of proven superiority over everything in its class. No other motor gives the same power in relation to bore and stroke. Our records in various contests have proven this. A most symmetrical combination of power, structural strength, durability and graceful design, typical of the highest mechanical art—for which Cincinnati is famous.

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AMALIE
Non-Carbonizing
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T. B. Q. Non-
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for your auto and
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SUITABLE FOR 1 TO 2 TON TRUCKS &
20 TO 40 HORSE POWER
SAMPLE OUTFIT FOR \$140.00

WITH SLIDING GEAR TRANSMISSION
THREE SPEED FORWARD, ONE REVERSE
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MAGNETO

"Always there"

Just Remember

That the **WORLD'S RECORD** for a road race, 74.65 m.p.h., was won and is held by Harvey Herrick with his **SPLITDORF EQUIPPED National** at Santa Monica, Cal., October 14, 1911,—

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That the **TOURING CHAMPIONSHIP**—the 1911 **GLIDDEN TOUR**, was won by three **SPLITDORF EQUIPPED Maxwells**,—

And **REALIZE OUR SUPREMACY.**

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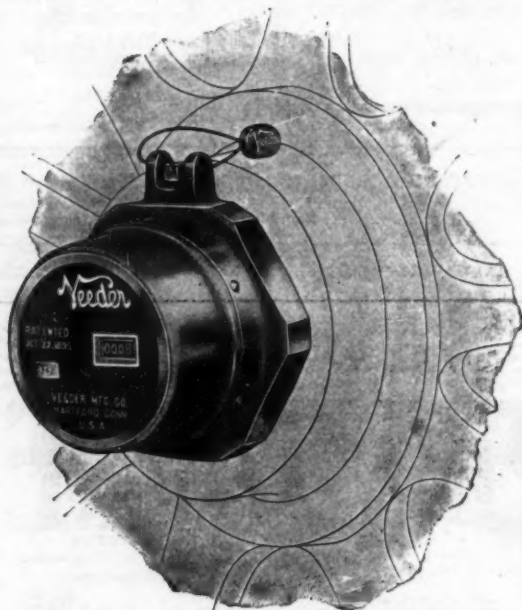
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When a man starts out with
HAM'S LAMPS
on his auto he *knows* he is not
going home in the dark.

If interested write.

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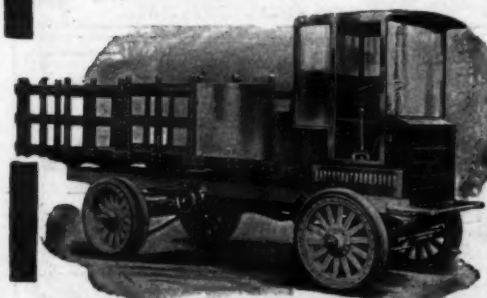
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LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCTION, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four-cylinder, one, two and three-ton. Four speeds forward, Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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Prices Include Complete Equipment

of fore-doors, top, windshield, gas lamps, generator, three oil lamps, horn and tools. All models have 4-cylinder, 20 H. P. Motor, Sliding Gears and Bosch Magneto.

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NOBBY TREADS

They Hold on Any Road

yes, even on the slipperiest, greasiest stretch of asphalt you ever struck.

It's the knobs that make them the strongest tires in the world.

UNITED STATES TIRE COMPANY
NEW YORK



High Tension Magneto

Model J

Guaranteed

to Start

4 Cyl. Auto

upto 30 H.P.



No Coil

No Timer

No Batteries

4 Cyl. \$50

6 Cyl. \$55

Absolute Synchronism and Perfect Results at All Speeds

Extremely simple—nearly half less parts than any other Magneto. Perfectly reliable.

We also make larger Magnetos for larger engines.

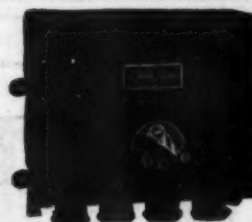
If you cannot gear-drive a High Tension Magneto, use one of our \$35.00 Low Tension belt or friction drive Magnetos and a K-W Spark Coil.

ELECTRIC LIGHTS can be run from K-W Low Tension Magnetos. Ask us about it. High Tension Magnetos are for ignition only.



Low Tension \$35.00
Belt or Friction Drive.
Used with K-W Coils. NO
Moving Wires. NO Brush-
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in ball bearings. Starts
engine without batteries.
Runs Electric Lights at
night.

We have a special Elec-
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The K-W Spark Coil.
Has its Winding
Guaranteed Forever
against breakdown

4-cylinder \$30.00
2-cylinder 18.00
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Marine Coils, \$6.00 & \$7.00

We make the Master Vibrator for FORD CARS.

No matter what your ignition troubles are, we have a guaranteed cure.

WE PAY THE EXPRESS East of the Mississippi River or to the Mississippi on points beyond on any of our goods when cash accompanies the order.

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Longer Lived Than Any Other, Says Ohio Dealer.

"We find that Fisk tubes are longer lived than any other. We have a great many users whose Fisk tubes are over four years old and the rubber is still bright and lively."

Name on Request.

*Inquire among
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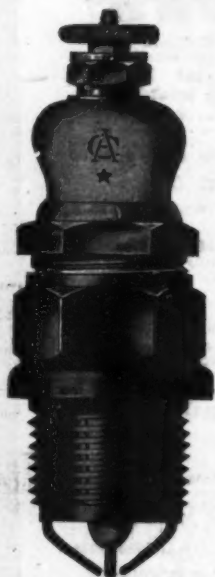
THE FISK RUBBER COMPANY

Department C

CHICOPEE FALLS, MASS.

Direct Factory Service in 34 Cities

"A C STAR" SPARK PLUGS



**"A CHAIN IS
AS STRONG AS ITS WEAKEST
LINK"**



and your ignition system is only as strong as its weakest part. Why not strengthen the spark plug "link" by installing "A C STAR" spark plugs in your present equipment? A majority of the leading manufacturers are using "A C STAR" spark plugs as standard equipment on their 1912 product. Our illustrated booklet is yours for the asking.

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Tear This Off You Need To Remind You *Speedo* IT'S GUARANTEED

REMINDER

If my dealer hasn't **SPEEDO**
I will order one direct,
Stating h.p.

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Chicago Branch:
Fulton-Grubb Co.,
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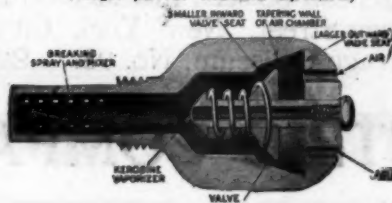
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A
Wonderful
Mechanism

Attached in five minutes on intake manifold. It breaks up and remixes the gas with a spray of air and injects additional air perfectly and automatically. Makes possible a rich low-speed mixture for cool weather. Fits every car. Saves money.

PRICE \$3.50

(High power models upward)



As Essential As the Carburetor

Absolutely Guaranteed:

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DEALER IS AUTHORIZED TO
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Total Height, 30 in.; Length, 35 in.; Weight, 280 lbs.; Double Cylinder Air Compressor; Piston Rings; Splash Lubrication

HERZ'S GARAGE PUMP

**150 Pounds
Compressed Air**

**Holds Enough Air to Inflate
Four Tires Outside of Garage**

Always ready for use. Just wheel it where it's needed, and connect to nearest lamp socket. It is made for any kind of current and costs practically nothing to run. No permanent pipe lines. No losses by leakage.

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Please mention The Automobile when writing to Advertisers



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Owing to the inability of the APPLE ELECTRIC COMPANY to secure suitable space for their exhibit at the New York Automobile Shows, they will display their line at their New York store, No. 20 Vesey Street. All visitors will be cordially welcomed there.

In addition to the complete line of Aplco Automobile Electric Lighting Systems, Lamps, Fixtures, etc.,

THE NEW APLCO ELECTRIC SELF-STARTER

will have its first public demonstration. It starts your engine. Lights your car. Furnishes current for ignition and signals. Can be seen in action on Inter-State cars.

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Aplco Electric Lighting Systems can be seen installed on Speedwell cars.

Don't forget the place—20 Vesey Street, New York City, during the Garden and Palace Shows. Our space at the Chicago Coliseum, No. 98. Boston, Mechanics Hall, 514 Dept. F.

APPLE ELECTRIC COMPANY, 16 North Canal Street
Dayton, Ohio, U. S. A.

“IN THE HEART OF THINGS”

HOTEL MARTINIQUE

ABSOLUTELY FIREPROOF

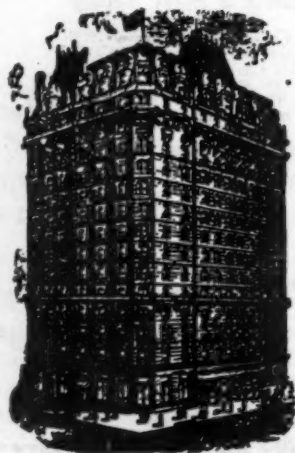
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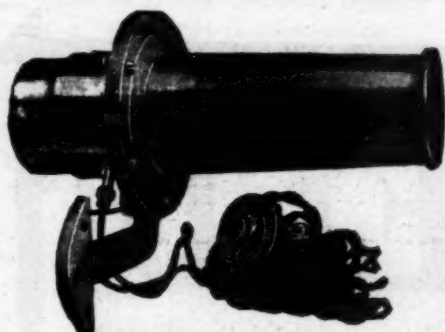
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Torpedo Type

Patented Sept. 5, 1911.

Put a "NEWTONE"

on Your Car—Standard Equipment
for 1912 Cars

Price \$20.00 Complete, including
Button and Cable

THE BEST ACCIDENT INSURANCE

Its musical note can be heard a mile away

INSURES

EFFICIENCY IN WARNING
ECONOMY IN OPERATION
STYLE TO YOUR CAR

No Automobile whether of foreign or domestic manufacture is complete without a Newtone Motor Horn.

Specify **Newtone** in your equipment. Its tone is clear, sweet and musical—yet so powerful that it can be heard a mile away. It warns without startling—and its novel design adds grace and beauty to any car.

ABSOLUTE SATISFACTION IS GUARANTEED

Manufactured and guaranteed by the largest manufacturer of automobile horns in America—a firm that for the past 8 years have made, and are still making, over 80 per cent. of the horns now in use in the United States.

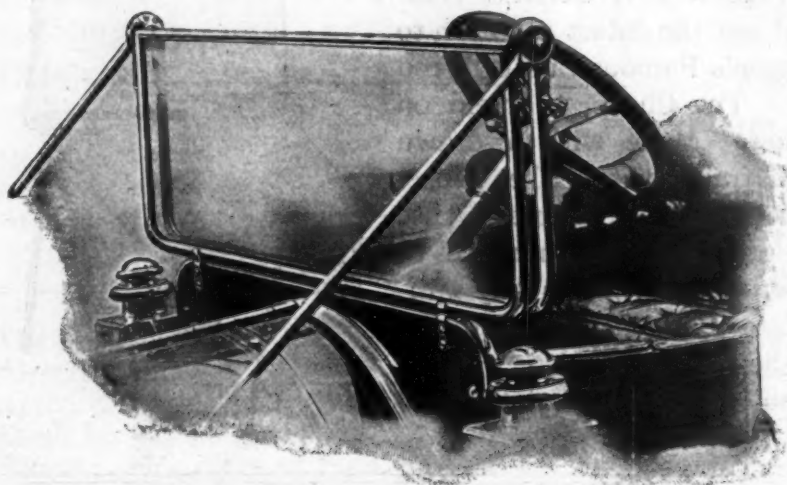
If your dealer does not carry the Newtone let us send you one on approval.

If not entirely satisfactory return at our expense. **The Newtone is unqualifiedly endorsed by every user.**

Automobile Supply Manufacturing Co. 229 Tenth Ave. near DeKalb Ave. Brooklyn, N. Y.

KINWOOD WINDSHIELDS

Made by The Manufacturer of one of the most comprehensive lines of Auto Parts in America



THE KINSEY MFG. COMPANY
TOLEDO, OHIO

Don't delay in sending for 1912 Proposition on KINWOOD WINDSHIELDS.

We have something in this proposition mighty convincing to the Trade.

You can't afford to omit looking over this Proposition because we are a big factor in the Windshield business today, and can help you in this end of your business nicely.

Write Now



We Shall
Exhibit

at
Chicago Show

January 27
to February 10

PITTSFIELD

High Tension Magneto
Free From Moving Wires

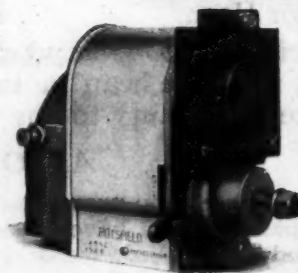
A high tension magneto, the sparks from which are followed by arc flames that ignite the weakest mixture instantly. The volume of flame never deteriorates and the heaviest engine may be started by a quarter turn of the crank without batteries.

The necessity for induction coil is eliminated as the high tension current is generated in the magneto coil which is stationary, the armature being free from moving wires.

This is a completely new design in magneto construction and its accuracy, effectiveness and dependability are accountable for the great and increasing demand for the Pittsfield Perfected Magneto.

PITTSFIELD SPARK COIL CO., Dalton, Mass.

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Type B

Obtain our catalogue illustrating the most perfect ignition system ever designed. On request.

Ford Model T Delivery Car

By reason of established efficiency this Delivery Car fits into the wants of business like the telephone. It extends your business. It is simple in design and strong in mechanical construction. Cheap in operation—a glutton for work—and sold at a price that has created an almost universal demand.

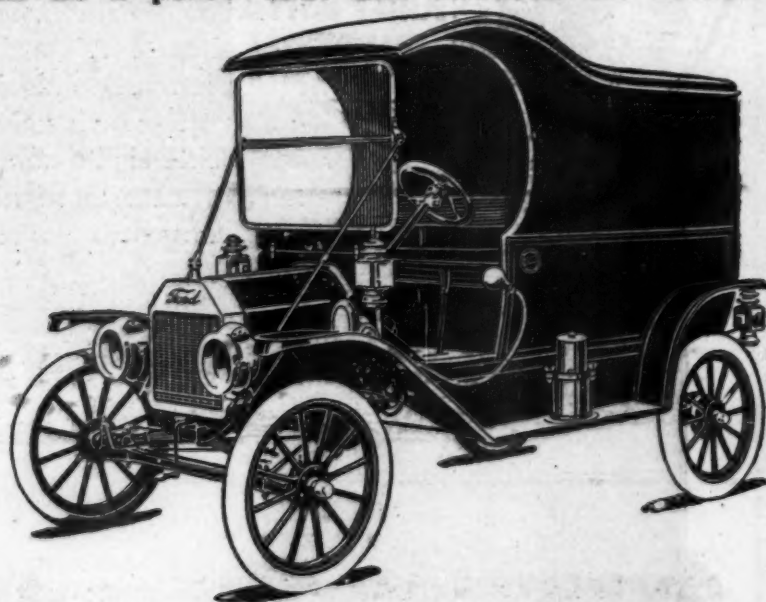
\$700

Fully Equipped

F. O. B. Detroit

This price includes full equipment—Automatic Brass Wind Shield, Speedometer, Ford Magneto built into the motor, two six-inch Gas Lamps and Generator, three Oil Lamps, Horn and Tools. No Ford Cars sold unequipped.

Capacity of this Universal Delivery Car is 750 pounds of merchandise.



We did not offer Ford Model T Delivery Car to the business world until we had thoroughly tried it out in the very line of work that business makes for a Delivery Car. Now—after two years of experience in delivering merchandise—two years over city streets of all sorts—over country roads—in hilly territory in all sorts of weather—winter and summer—we know this car will “deliver the goods.” We therefore recommend Ford Model T Delivery Car with our broadest warranty as a dependable, economical, durable, convenient, money-saving delivery car—for the big store, for the little store—for the city, town, village, or country.

The purchase price is low, and the maintenance—

from facts established during continuous service—about five cents per mile.

At present we can make immediate delivery, but the way orders are coming in prompts the suggestion that you place your order without delay.

Ford Model T Delivery Car has the same Vanadium Steel Chassis which has made Ford cars so practically useful and popular the world over. It has a handsome pressed steel body with a merchandise carrying capacity of 750 pounds.

Four thousand Ford dealers scattered all over the country will give your order prompt attention!

Fixed Prices on Quantity Orders For Ford Motor Cars for Commercial Purposes

To concerns who purchase Ford Cars in quantity lots for Commercial Purposes we will give the benefit of a rate reduction or discount—we have fixed a sliding scale of prices which will be submitted on request. Catalogs and detailed descriptive literature will be mailed gratis. Branch Houses and Large Distributors in all Principal Cities—Dealers Everywhere.

Ford Motor Company

Detroit, Michigan, U. S. A.

Please mention The Automobile when writing to Advertisers.

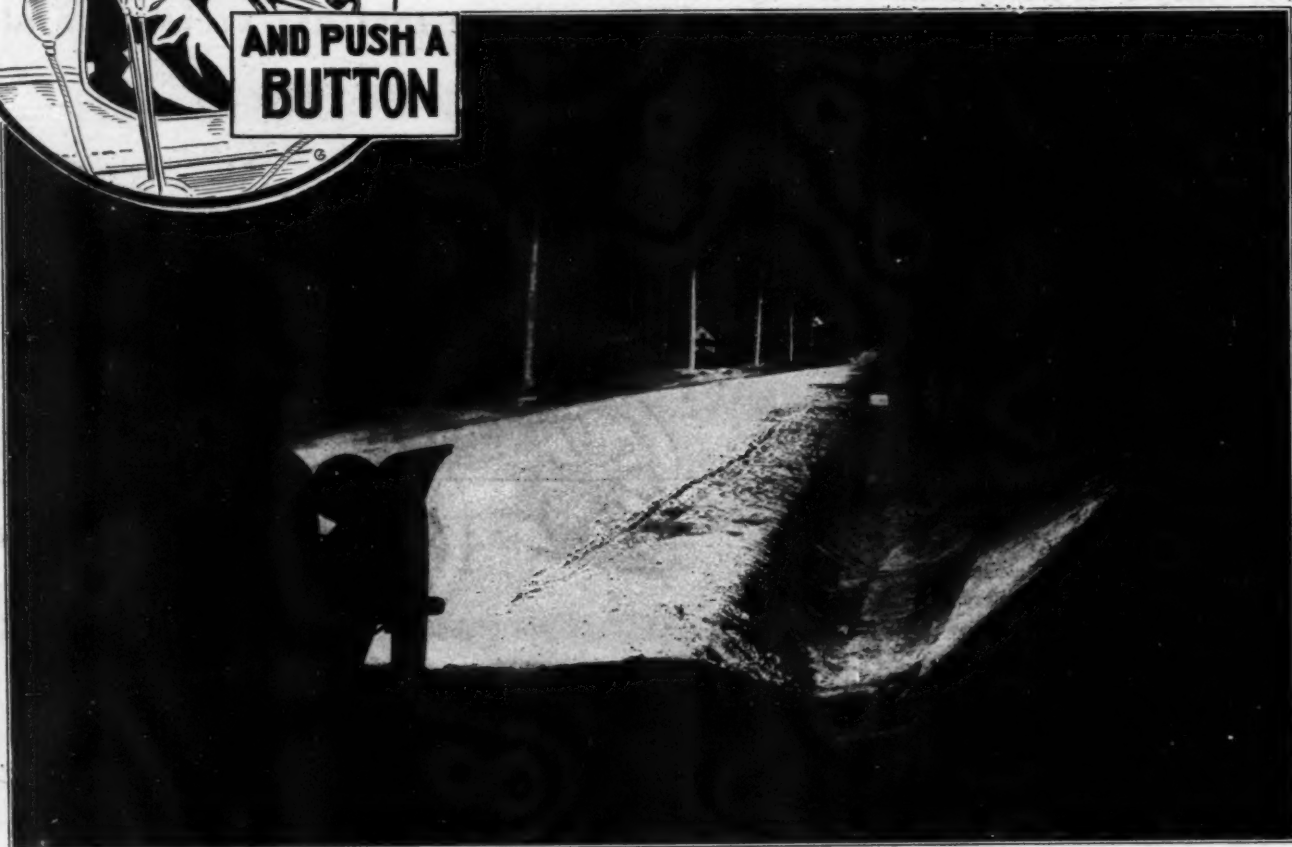
SIT IN YOUR SEAT



**AND PUSH A
BUTTON**

**HAVE
ELECTRIC LIGHTS**

CONVENIENT—RELIABLE—CLEAN



USE THE



**ELECTRIC LIGHTING BATTERY
WITH AN
ELECTRIC LIGHTING GENERATOR**

Write us for full information

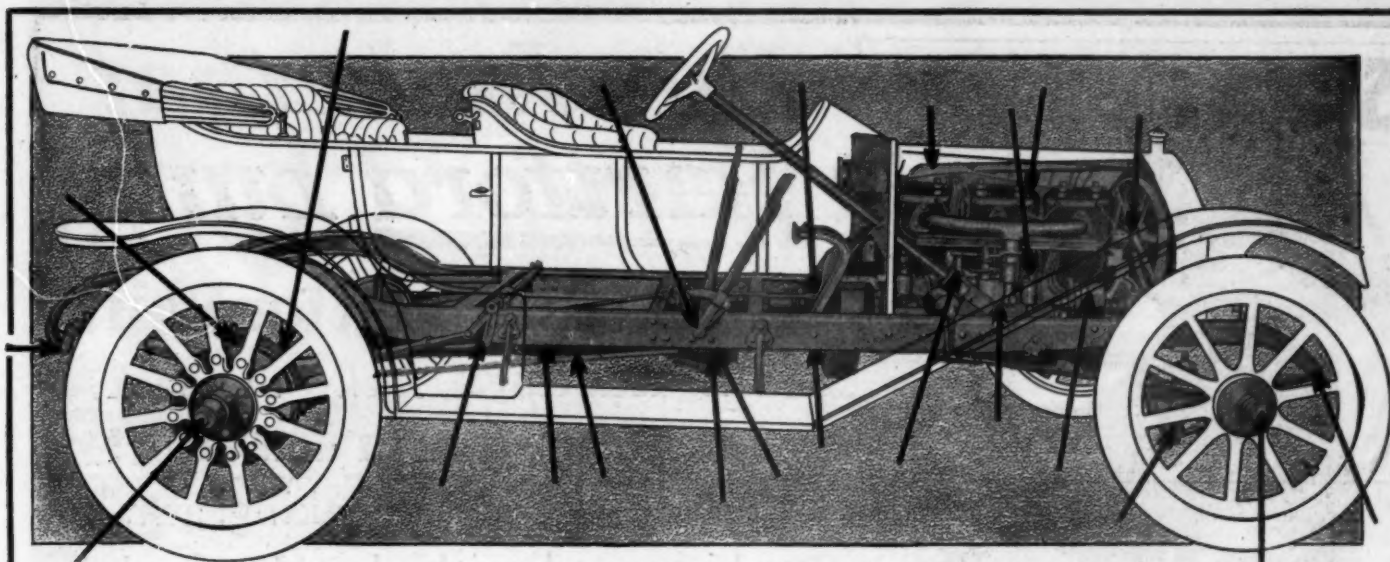
**WILLARD STORAGE BATTERY COMPANY
CLEVELAND, OHIO**

NEW YORK BRANCH: 136 W. 52nd St.

DETROIT BRANCH: 1191 Woodward Ave.

CHICAGO BRANCH: 436 So. Dearborn St.

Please mention The Automobile when writing to Advertisers



This illustration indicates the location of the oiling points of a motor car (the number and location of these points vary in different types of cars). Unless properly lubricated an automobile will give trouble and soon wear out.

"Spare the Oil and Spoil the Car"

PENNIES saved on oil or grease may mean dollars spent in up-keep—not to mention annoying delays or the shortened life of your car.

For motorists who recognize the economy of using the best oil we have produced Polarine.

It is not a low-priced oil. But in the long run it will prove sound economy.

Polarine Oil goes through special processes of distillation, pressing and reducing. It is then carefully cleaned and filtered to remove impurities and free carbon. This secures the correct lubricating qualities for gas engine use.

Polarine leaves no appreciable carbon deposit.

Its consistency or "body" is not materially affected by either high or low temperatures. It flows freely down to zero.

Polarine

The Polarine Brand covers:

Polarine Oil (in five gallon, gallon and half-gallon sealed cans),
Polarine Transmission Lubricants, **Polarine Fibre Grease** and
Polarine Cup Grease.

These lubricants cover the needs of every part of the car.

Send to our nearest agency for "Polarine Pointers," which include hints on the care of motor cars.

Standard Oil Company

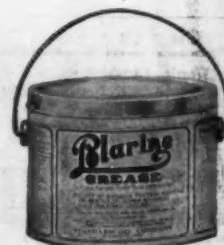
(Incorporated)



Polarine Oil. For all types of gasoline engines. Delivered in sealed cans—five-gallon, gallon and half-gallon sizes.



Polarine Transmission Lubricants. Prepared in three consistencies, "A," "B," "BB." The cans are of convenient size.



Polarine Fibre Grease, Polarine Cup Grease. Delivered in round cans. More information in our booklet. Send for it.



The Jack that Hartford built

That's the Jack for You!

The **Hartford** Jack—the jack with the **long arm** and **short stroke**—no back-breaking, arm-aching work with the Hartford.

Look at the inside construction of the

Hartford Auto-Jack

Equip your car with the Truffault-Hartford SHOCK ABSORBER FOUR MODELS

Standard for cars over 2500 lbs. per set of four.....	\$60
Intermediate for cars from 1800 lbs. to 2500 lbs.....	\$45
Junior for smaller cars weigh- ing 1200 lbs. to 1800 lbs.....	\$25
Juniorette for small cars like the Ford, AA Maxwell, Hup- mobile, etc.....	\$15

Our new catalog, just off the press, will make all this clearer in an interesting way. Beautifully illustrated. Write us for a copy today.

Buy the Easy Riding Car

Don't think because you happen to be buying a small and inexpensive car that it must necessarily be a hard riding machine. Get a demonstration of several makes of cars and compare their riding qualities. Give this feature your special attention in deciding which car you intend to purchase, because with properly designed springs and Shock Absorbers the car you buy can be made to ride as smoothly as one of the highest priced cars. An easy riding car not only means motoring in comfort, but considerably less expense for upkeep, tires and repairs. Think this over.

So simple—it simply *can't* get out of order—and made so well and of such fine materials it lasts a lifetime.

So scientific—it takes only *one-third the effort* an ordinary jack requires.

And equipped with a *mechanical* reversing device so that you know positively your car will go up or down as you want—no guesswork.

Be sure you get the Hartford—then you're sure to have the best—the jack that's always ready to use—the jack that never slips, shakes or lets go its grip.

Sold by Dealers Everywhere

You will find the Hartford for sale by most dealers—but if your dealer does not carry it, we will send you one direct on receipt of price—with the strict guarantee that your money will be immediately returned to you if for any reason you are not entirely satisfied with your bargain.

**Price, complete with strong
canvas containing bag \$8**

Hartford Suspension Co.

E. V. Hartford, 140 Bay St., Jersey City, N. J. President

New York, 1700 Broadway,
212-214 West 84th St.
Chicago, 1458 Michigan Ave.
Boston, 325 Columbus Ave.
Philadelphia, 1437 Vine St.
Newark, 289 Halsey St.



If You're Endorsing

the *wrong* speedometer—a speedometer that *costs more* than the *Stewart* (and isn't half as good as the *Stewart*)—you may find yourself in the position of the Irishman who grabbed the wild-cat; you won't want help to *hold* it—you'll be calling to your friends to help you let it go.

Begin at the right time—*now*—and get the right speedometer, *now*.

The *Stewart* is fit for us to guarantee, and so it's fit for you.

The *better* the car, the more reason to equip it with the *Stewart*.

We could not make it *more* satisfactory if we made the selling price a thousand dollars.



Speedometers, \$15 to \$30
Clock Combinations, \$45 to \$70

Stewart Speedometers are attractive—beautifully made—open dials—large figures—easily read—absolutely accurate; 100,000-mile season odometer; 100-mile trip register, can be set back to any tenth of a mile. Strongest flexible shaft, drop forged swivel joints (an exclusive feature), quiet road wheel gears.

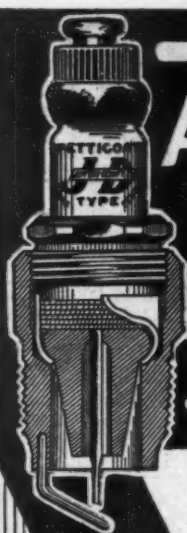
"ALWAYS ON THE JOB."

Stewart & Clark Manufacturing Company

1852 Diversey Boulevard, Chicago, U. S. A.

Detroit	San Francisco	New York	Los Angeles	Chicago	London
Cleveland	Philadelphia	Minneapolis	Indianapolis	Kansas City	Paris





A COMPLETE LINE OF SPARK PLUGS

EFFICIENT-DURABLE-ECONOMICAL



"J. D." Spark Plugs at 75c are the Best Buy on the Market Today

The mechanical principles involved in the working of "J. D." Spark Plugs represent the best ignition practice. Therefore, since the "J. D." plugs are made entirely in our own plant, we can and do guarantee them to be as perfect as the best materials and workmanship can make them. The motorist can select any one of the three types of "J. D." plugs—Petticoat, Closed End or Conical. They are all sold at the same price and the same iron-clad guarantee goes with each one.

"Your money back or a new plug if you are not satisfied."

The porcelain in "J. D." plugs is made in our own pottery and is positively heat-proof. The open market cannot be depended on for the consistent excellence of the porcelain used in "J. D." Plugs. And we are the only makers of spark plugs making our own porcelain from the raw material.

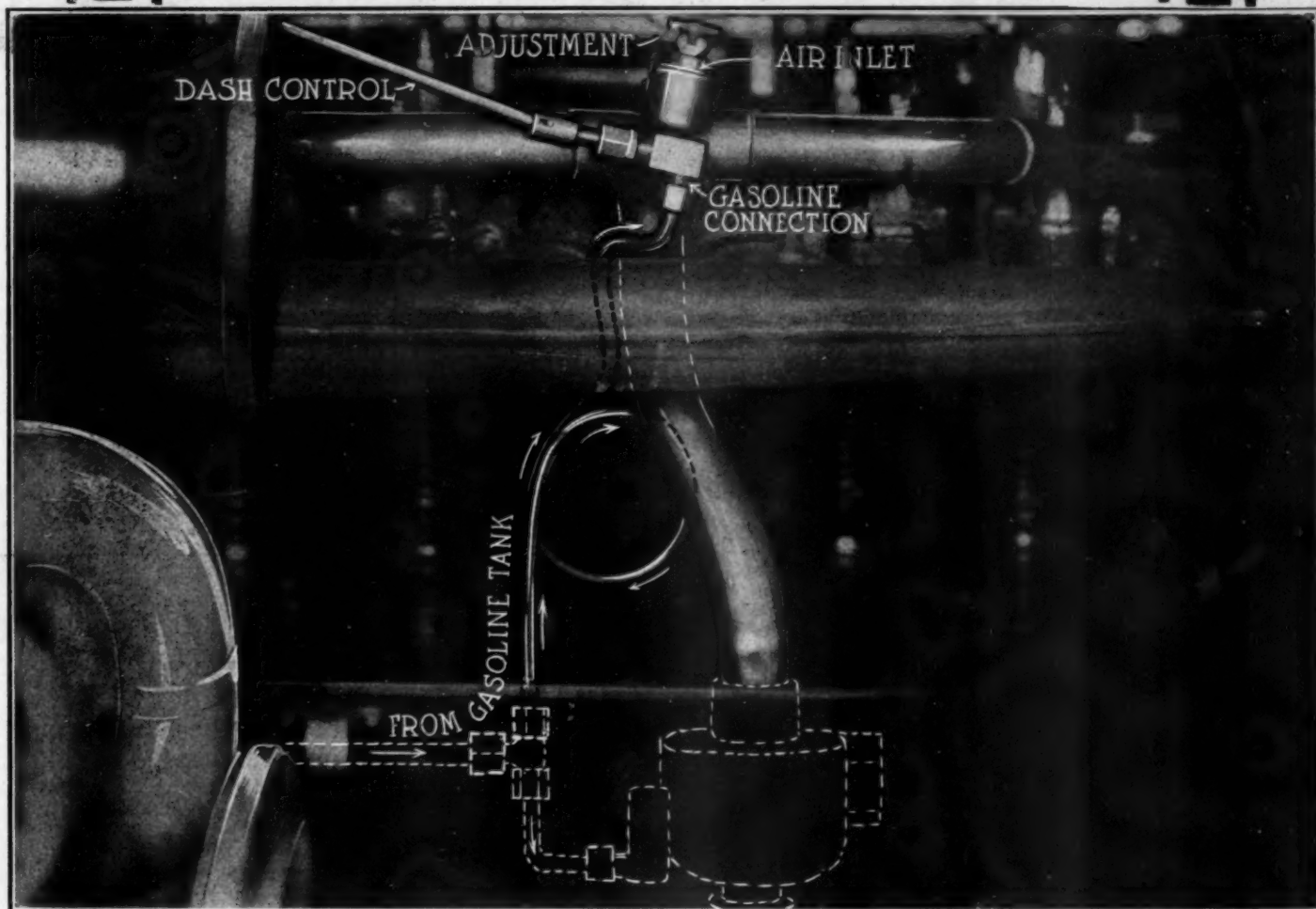
If your dealer hasn't "J. D." plugs in stock, we will send them to you on receipt of price.

Jeffery Dewitt Co.
52 Butler Avenue,
Detroit, Mich.



75¢

POSITIVE STARTING



BY THE AUTOMATIC PRIMER

Have you discovered that your starting difficulties are largely due to the fact that your motor is not supplied with the correct mixture at the time you turn it over? Whether you crank your motor or use an automatic starter, you must have **THE AUTOMATIC PRIMER** if you want positive starting every time.

THE AUTOMATIC PRIMER is a device which supplies the gasoline direct to the cylinders—entirely independent of the carburetor. It is operated by a valve from the driver's seat; it automatically primes the motor regardless of the temperature of the weather, without the use of auxiliary tanks, air pressure, or pumping device.

THE AUTOMATIC PRIMER saves so much gasoline that it pays for itself in a short while. Its saving is due to the fact that the additional gasoline required in starting and warming up your motor to a normal condition comes through the primer, thereby leaving the most economical adjustment of the carburetor undisturbed.

With **THE AUTOMATIC PRIMER** we guarantee that in 50 50% of the cases you will start from the spark and in 95% of the other cases you will start on the first time you turn your motor over.

THE AUTOMATIC PRIMER has been tried out so thoroughly and has been so universally appreciated that we feel justified in telling you of its wonderful merits and guaranteeing its usefulness.

We will express you the primer with all its necessary connections, so that all that it is necessary to do in order to connect it is to tap your manifold and connect your gasoline line, which can be done without cutting or threading the pipe. The dash bracket is fitted on with three wood screws. You can put **THE AUTOMATIC PRIMER** on the car yourself in a very few minutes.

The price is \$6.00 complete. With every primer is furnished instructions for installation and operation. Try it 30 days and if not entirely satisfactory return it and we will refund your money. Sent C. O. D. if so desired.

The Automatic Priming Device Company

1507 Michigan Ave., Chicago, Ill.

Enclosed please find \$6 for which send me on approval your **AUTOMATIC PRIMER**. It is understood that money will be refunded any time within thirty days from date of purchase if the device is in the least unsatisfactory.

Name

Add

Name of car

Model

Please mention The Automobile when writing to Advertisers

VANDERBILT CUP CARS

Second Chapter of Facts

Published in the Interest of Honest Advertising

Last week we felt compelled to notice certain advertisements made in behalf of another manufacturer of ball bearings, claiming the use of those bearings in certain winning or placed cars in Vanderbilt cup races. Those advertisements were so worded as to give the impression that that make was sole or principal equipment in the cars named.

Since publishing our recent advertisement we have learned from the Lozier Motor Company that three minor transmission bearings in the winning and fourth placed Loziers in the recent race were not of our make. We do not seek credit not fairly earned, so we hasten to disclaim the credit.

Now Regarding the Wishart Mercedes

We have since secured the entire set of ball bearings used in this car in the recent Vanderbilt race. They number 25, as follows:

19 annular bearings—	HESS-BRIGHTS
4 thrust bearings—	HESS-BRIGHTS
2 thrust bearings—	another make
25	

The last two thrusts are small bearings used in the *steering knuckles!* Truly, "it was a famous victory"—for HESS-BRIGHTS!

These same 25 bearings from the Wishart car will be at our exhibit at the Madison Square Garden show, where we shall be glad to show them to anyone interested.

HB Here Is the Story to Date DWF

1908	Locomobile	HESS-BRIGHTS sole equipment.	Cup Winner.
1909	Alco	HESS-BRIGHTS " " " "	
1910	Alco	HESS-BRIGHTS " " " "	
1911	1 Lozier (Mulford)	HESS-BRIGHTS in engine and transmission, except 3 minor bearings.	Cup Winner.
	3 Mercedes (Wishart)	HESS-BRIGHTS throughout, except steering knuckle thrusts.	
	4 Lozier (Grant)	HESS-BRIGHTS, same as No. L.	

It has been said of a certain class of advertisers that "they do not misrepresent; they merely exaggerate the truth."

But there is a point—in art or advertising—where "exaggeration" becomes caricature or worse.

Need We Point the Moral?

THE HESS-BRIGHT MANUFACTURING COMPANY

STANDARD OIL
TROPHY

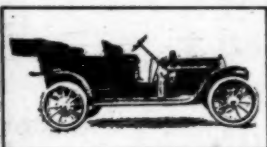
WINNER OF ALBANY HILL CLIMB
CLASS A-2-DIV 3
PERFECT ROAD SCORE
1000 MILE RELIABILITY

TELEPHONE KEDZIE 1833

H. E. HALBERT, PROP.

Garfield Park Automobile Garage

DISTRIBUTOR



SALESROOM
1408-10 MICHIGAN AVENUE
TEL. CALUMET 4988

The Powerful
*Stout*The Rugged
Puget-Detroit

606-612 INDEPENDENCE BLVD.
CHICAGO

EXPERT REPAIRING

FULL LINE OF SUPPLIES

FIRE PROOF STORAGE

Chicago, Ills.

Nov. 7th, 1911.,

Stromberg Motor Device Co.

64-66 E. 25th St.,

Chicago, Ills.

Gentlemen:-

With great pleasure I acknowledge the remarkable assistance the Stromberg Carburetor gave me in winning the Standard Oil Trophy for Fuel Economy in the Chicago Motor Club's Seven Day Reliability Run.

I made not a single adjustment to the Carburetor throughout the seven days, and we made 17.5 Miles per gallon with a heavy Car for the entire distance.

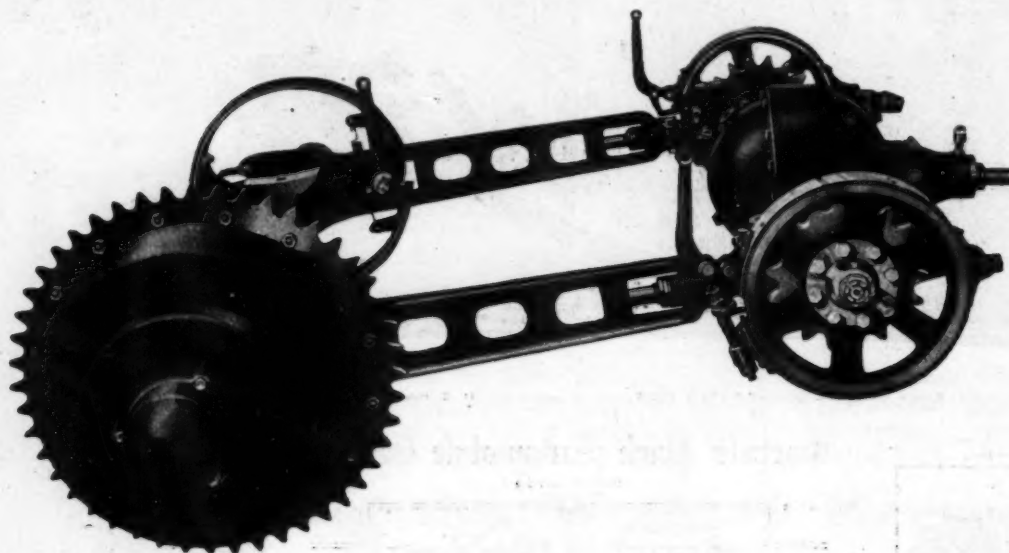
Again thanking you for the great assistance rendered by your Device, I am,

Yours very truly,

You can
do the
same

STROMBERG MOTOR DEVICES COMPANY, 64-66-68 E. 25TH ST., CHICAGO

NEW YORK BRANCH, Automobile Building, 1926 Broadway, at 64th Street. BOSTON BRANCH, Motor Mart, 91 Church Street. DETROIT BRANCH, 1211 Woodward Avenue. INDIANAPOLIS BRANCH, 514 North Capitol Avenue. NORTH-WESTERN BRANCH, 1514 Hennepin Avenue, Minneapolis. LOS ANGELES BRANCH, 945-7 S. Main Street. SAN FRANCISCO BRANCH, 307 Golden Gate Avenue.
DISTRIBUTORS—Chandler & Lyon Motor Supply Co., Los Angeles, San Francisco and Fresno, Cal., Seattle and Spokane, Wash., Portland, Ore. John Millen & Son, Ltd., Toronto, Montreal, Winnipeg, Vancouver. Post & Lester, Boston, Worcester and Springfield, Mass. Hartford, Bridgeport and New Haven, Conn. Auto Equipment Co., Philadelphia, Pa. Way-Mitchell-Rigdon Co., Cleveland, O. James G. Barclay, Buffalo, N. Y. Prince-Wells Co., Louisville, Ky. Von Ham-Young Co., Ltd., Honolulu, T. H. Kansas City Auto Supply Co., Kansas City, Mo. Phoenix Auto Supply Co., St. Louis, Mo. Auto Equipment Co., Denver, Colo. Coughlin & Davis, Cincinnati, O. Pittsburgh Auto Equipment Co., Pittsburgh, Pa. Mehler & DeGress, Mexico City, Mex. Auto Supply Co., Baltimore, Md. Sharmann Auto Co., Salt Lake City, Utah. Fisk Co., of Texas, San Antonio, Tex. Omaha Rubber Co., Omaha, Neb. Syracuse Rubber Co., Syracuse, N. Y. Kelley Hardware Co., Duluth, Minn. Belcher & Loomis, Providence, R. I. A. H. DeDiaz & Co., Havana, Cuba. Alexander-Seewald Co., Atlanta, Ga.



Jack-Shaft Service Brake on Timken Rear Equipment for Commercial Trucks

The Timken Service Brake is mounted outside the chain. *It is easy to reach for adjustment.*

Its large diameter and wide face give extra generous braking surface. *It holds like a bulldog.*

The broad steel band is anchored in a strong arm projecting from that part of the radius rod which swivels over the jack-shaft housing. *It is anchored for all storms.*

There is slight adjustable play in the anchor and in the support at the toggle, so the grip is strong and even. *The brake can't cramp.*

The lining of homogeneous asbestos and copper wire has proved in Timken experience to wear like iron and never over-heat. *It takes hold easy, but grips like metal on metal.*

Timken-Detroit Axles and Timken Roller Bearings will be shown January 6th to 20th in booths 165-166, Madison Square Garden, New York City. Drawings and full details of Timken Rear Equipment may be had from our Engineering Department any time.

THE TIMKEN-DETROIT AXLE COMPANY
DETROIT, MICHIGAN, U. S. A.

The only axle manufacturer licensed to make axles equipped with the famous Timken Roller Bearings.



Please mention The Automobile when writing to Advertisers

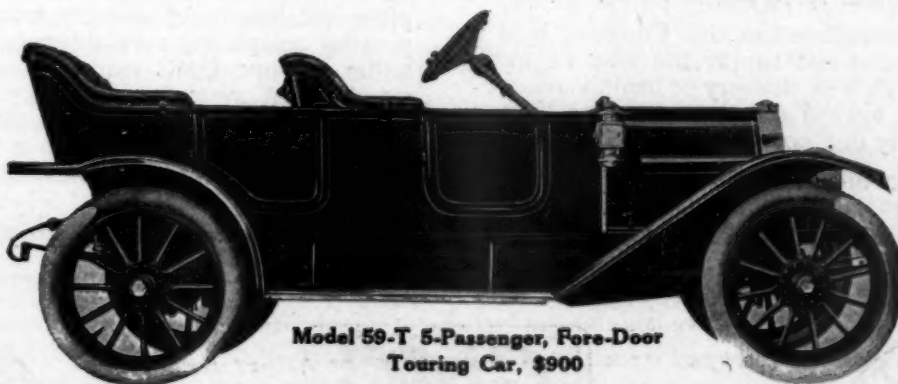
Overland

JUDGED from every possible angle our \$900 thirty horse-power five-passenger touring car gives you just as much car, just as much comfort, just as much power and speed and just as fine construction as any \$1250 car of like type made.

A calm estimate of actual values—a careful comparison of specifications will prove this to be a positive fact.

Our model 59 is the greatest value on the market today. Write for book G 412.

The Willys-Overland Company, Toledo, Ohio



Model 59-T 5-Passenger, Fore-Door
Touring Car, \$900

Wheelbase 106 inches; motor 4x4; horsepower 30; Splitdorf magneto; transmission selective, 3 speeds and reverse; F. & S. ball bearings; tires 32x3 1/2 O. D.; 3 oil lamps, 2 gas lamps and generator. Complete set of tools.



GMC

MODEL K
CAPACITY 5 TONS
PRICE, CHASSIS ONLY,
\$4400

This truck is one unit of A Fifty-Ton Equipment

James Butler, Inc., the big New York chain store grocery house has ten trucks of this model, purchased in five orders over a period extending from January, 1910, to September, 1911. The oldest (shown above) and the newest are daily working side by side. So successful have these trucks proven that this concern recently placed on sale their entire remaining stable of heavy draft horses, 100 of them, for the purpose of replacing all with GMC trucks. The first purchase was this one truck; it has sold all the rest.

The best proof of the reliability, efficiency and economy of GMC trucks is in the fact of such repeat orders as this. The GMC line comprises both gasoline and electric trucks in capacities from 1,000 lbs. to 6 tons.

As a result of this complete line, this Company is in a position to recommend and supply the kind of truck best adapted to any given delivery or hauling requirement, without bias toward either gasoline or electric power or toward any one special type of construction.

GMC gasoline trucks are made in both standard types—

the lighter capacities with motor under the hood and the heavy-duty trucks with motor under the seat. We are prepared to handle your delivery problems in a comprehensive instead of a fragmentary way, supplying complete installments of delivery trucks, which, although possibly comprising several types, will be standardized under the one GMC mark. It is only with such a standardized system of delivery that the maximum efficiency and economy are possible, to say nothing of the advantages of dealing with a single manufacturer, with a single center of responsibility and service.

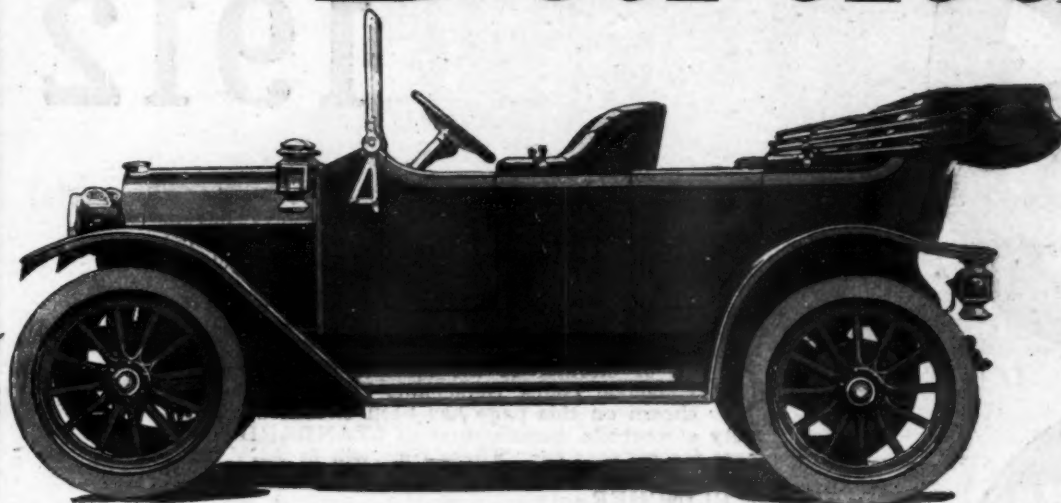
GMC Gasoline and Electric Trucks will be exhibited at the New York, Chicago and Boston Shows.

Correspondence from prospective purchasers and dealers is invited.



Please mention The Automobile when writing to Advertisers

The *Detroiter*



A 25-H.P. Touring Car—Ball Bearing Throughout

\$850

(F. O. B. Detroit). Completely equipped with Top, Side Curtains, Windshields, 3 Oil Lamps, 2 Gas Lamps, Generator, Horn, Tools, Tire Repair Kit. The name typifies the best that the "Automobile Capital" affords, in designing skill, efficient manufacturing and in able financing.

This New Car is Just a Little Better Than the Low-Priced Field Has Known

Satisfaction has never overwhelmed the users of low-priced cars. These owners have always felt that there was something to be desired. Maybe they wanted a stronger axle, more power, larger braking surfaces. Probably they wanted less noise. Maybe it was more room they wanted. Maybe easier riding. It seems at any rate that there was always something lacking—something that the owners of high-priced cars enjoyed.

Now comes the *Detroiter*, profiting by the mistakes of the past, with a car that has eliminated these weaknesses. A new car, ball-bearing throughout, with a long-stroke, silent, powerful motor, pressed steel rear axle with gears that positively will hold up, abnormal braking surface, full platform springs in the rear and other high-class features seen only in cars selling at double the price.

The *Detroiter* has no freak theories to exploit. Designing theories needed no upheaval. But the demand was for specifications that will insure safety, service and satisfaction.

The car is now on the market. It is built in a new factory by Claude S. Briggs, who with W. S. Lee designed the *Detroiter*. Associated with them in this new Company is Emil D. Moessner and a coterie of the most experienced manufacturers in the automobile capital.

Dealers read the *Detroiter's* specifications and see if you, too, do not regard this car at \$850 as the greatest proposition ever put onto the market. The announcement of this car and its builders has caused such a flood of inquiries and contracts that if you desire to handle this car in your territory write or wire at once for literature and dealers' proposition.

SPECIFICATIONS

Motor—25 H.P., $3\frac{1}{4}$ " x $4\frac{1}{4}$ ", bore and stroke cylinders cast en bloc.
 Wheel Base—104 inches.
 Gauge—56 inches.
 Tires—32" x $3\frac{1}{2}$ ".
 Springs—Front, semi-elliptic.
 Springs—Rear, full Platform.
 Axle—Front "I" beam drop forged.
 Axle—Rear, full floating.
 Frame—Pressed steel, channel section.
 Valve Arrangement—Enclosed, all on one side. Valves extra large, with special means of adjustment.
 Fuel Supply—Gravity feed.
 Ignition—Bosch magneto.
 Lubrication—Splash feed, constant level.
 Cooling—Thermo-syphon.
 Radiator—Tubular, square front.
 Motor Suspension—Three-point.
 Clutch—Multiple disc.
 Change Gear—Selective center control.
 Speeds—Three forward and reverse.
 Transmission—Unit with power plant.

BRIGGS-DETROITER COMPANY, 451 Holbrook Avenue, Detroit, Mich.

RIMS 1912



TYPE No. 1



TYPE No. 2



TYPE No. 3

From the inception of the automobile industry, buyers of rims (including manufacturers as well as consumers) have looked upon us as an authority on this subject and await our annual announcement before placing orders. Because of this anticipation, and reliance in our statements, we make the following announcement:

ONE or another of the three types of Standard Universal Quick Detachable Demountable Rims shown on this page has been chosen by nearly every automobile manufacturer as STANDARD equipment for his 1912 car. These rims will fit ANY make of domestic automobile tire, either STRAIGHT SIDE or CLINCHER.

Type No. 3 you are familiar with and present indications are that it will be as popular during the coming year as it was in the past.

Types Nos. 1 and 2, which so quickly climbed into favor with the trade, are, from indications of orders received, going to remain in their present high position. The same felloe band is used on Types Nos. 1 and 2 and will accommodate the rim base or outer rim of either type. The side rings are reversible, accepting either straight side or clincher tires. The locking bolts used in the demounting feature are truly the most wonderful device employed for this purpose, a few turns securely fastening the rim into position.

To summarize, all three types are HIGHLY perfected and hundreds of sets are being shipped DAILY to ALL parts of the WORLD and giving SATISFACTION wherever used.

We shall have all three designs on exhibition at Madison Square Garden, New York, January 6th to 20th and at the Coliseum, Chicago, January 27th to February 10th. Your inspection of them we shall consider a great favor and you will be IMPRESSED by their PERFECT construction and HIGH efficiency.

NOTE—We shall reserve a *limited* number of our 1912 Show Booklets for those unable to attend either show. Postal request or your business card will secure a copy. *It is worth while.*

**THE
STANDARD
WELDING
COMPANY
CLEVELAND
NEW YORK
CHICAGO
DETROIT**



WHEREVER you may be located, Mr. Dealer, the Detroit Electric will make good. This is the car that is so popular in such hilly cities as Kansas and Seattle. Whatever the conditions in your city, you can recommend this car with absolute assurance that it will satisfy your customers and sell more cars for you.

The Detroit Electric has many exclusive and patented features that cannot be obtained elsewhere, but, what is more to the point, they are features that the public is fast learning to appreciate and are going to demand in an electric vehicle more and more. For instance, those who really know about electric cars are insisting upon a real Shaft Driven car. They will not be satisfied with merely a Shaft Drive with concealed chains at the motor. They want the "Shaft-Drive" "Chainless." Please note the word "Chainless." It means the entire absence of chains or gear reductions at the motor. You cannot obtain this drive except in a Detroit Electric.

The reason we have produced an exclusive Shaft Drive is because of the original type of motor we have developed to meet the peculiar requirements of an electric car. We do not use "stock" motors because they are not speeded and designed to fit the conditions surrounding the electric pleasure car. There are a dozen other features that you should know about that space does not permit mentioning.

THE
Detroit
ELECTRIC
Shaft Drive
Chainless

Our new catalog, which, by the way, you must see to appreciate, will give you a better idea of this remarkable car. We will gladly send it on request.

We will exhibit at Madison Square Garden Jan. 7th to 13th, Chicago Feb. 2d to 9th.

ANDERSON ELECTRIC CAR COMPANY

416 CLAY AVENUE, DETROIT, MICH.

Branches: New York, Broadway at 80th St. Brooklyn, Cleveland, Minneapolis,
Chicago, 2416 Michigan Avenue, Buffalo, Kansas City, St. Louis.

Selling representatives in all leading cities

1912

New Year's Eve.

Ring out, wild bells, to the wild sky,
The flying cloud, the frosty night;
The year is dying in the night;
Ring out, wild bells, and let him die

Ring out the old, ring in the new;
Ring, happy bells, across the snow;
The year is going, let him go;
Ring out the false, ring in the true.

—Tennyson

A Card

In re Vanderbilt Race

and

F & S Ball Bearings

A man hath joy by the answer of his mouth: and a word
spoken in due season, how good is it!—Proverbs xv: 23.

For over fifteen years the world-renowned house of Fichtel & Sachs, of Schweinfurt, a/M., Germany, the makers of the famous F. & S. Ball Bearings, by virtue of their fundamental patents in all countries, their own inventions, and those acquired from other original sources, have occupied the premier position in the ball bearing industry. This supremacy has been unquestioned because of not only the high quality, but also because of their quantity production of fifteen thousand complete ball bearings daily for various purposes, besides which, their allied ball making plant produces millions of chrome steel balls daily, the two plants employing over thirty-five hundred work-people.

Meanwhile the J. S. Bretz Company, their sole American Representatives, have not been unmindful of the high standing and dignity of the great German concern, and in all their ball bearing literature, advertising, publicity and selling campaigns have adhered strictly to ideal, high-minded, safe and sane methods of doing business. That this course was founded on correct principles is evidenced by the constant growth and volume of our business, the mechanical popularity of the bearing, and our financial success and prosperity from a humble beginning.

A self-appointed public censor of our advertising has in his own heterophemistic way raised a tempest in a teapot over the ball bearings used in the four placed cars in the Vanderbilt Race.

It was Webster who said: "Never mind, your honor, what the plaintiff claims; what say this array of competent witnesses?" Webster's logic applies admirably well to this controversy, doesn't it?

One of the earliest and largest American users of F. & S. Ball Bearings was and is the Lozier Motor Car Company. Almost every notable competitive event won by them, such as road races, hill climbs, gasoline efficiency trials, speedway races, twenty-four hour races, etc., etc., was done on cars equipped with F. & S. Ball Bearings. Naturally enough we rejoiced with them, their agents, and the Lozier car users over these victories. We

advertised these many wins, sometimes by means of signed testimonials from the Lozier Motor Car Company, the latter of which attributed the success of the Lozier cars in these events to the F. & S. Ball Bearings. It is to be noted that we always do all of this with the different makes of cars who use the F. & S. product, not so much for our own personal profit, but to advertise the users of F. & S. Bearings in particular, and to spread the gospel of anti-friction construction in the conservation of power, by that "efficiency which is the ratio between a standard of performance and the actual performance."

If we were fond of Kipling we might quote—"After me cometh a Builder—Tell him, I too have known!" Here follows the whole bearing story of the Vanderbilt Race:

Copy of telegram to
LOZIER MOTOR COMPANY,
Detroit, Michigan.

Dec. 16, 1911.

— raises controversy over our advertisement that F. & S. bearings were used in Lozier Vanderbilt cars—our authority your Mr. Perrin. Kindly wire confirmation stating where our bearings were used, and if other makes, also state what and where. Reply desired by Monday. Yours for fair play.

J. S. BRETZ COMPANY.

Lozier says—"The makers of the F. & S. Bearings are, therefore, correct in stating their bearings were used in this car."

LOZIER MOTOR COMPANY
DETROIT, MICH.

Manufacturing Dept.,
J. S. BRETZ COMPANY,
Times Building, New York, N. Y.

December 16, 1911.

BEARINGS USED IN RACER.

GENTLEMEN—In answer to your telegram relative to the bearings used in car which won the Vanderbilt Cup Race, would

Please mention The Automobile when writing to Advertisers

A Card

In re Vanderbilt Race

and

F & S Ball Bearings

(Continued)

state that this car was fitted with ——— bearings throughout the entire engine, and also throughout the transmission, with the exception that one small F. & S. bearing was used in transmission on account of its narrow width, and a couple of thrust bearings of the F. & S. make were also used.

The rear axle, however, was fitted with the F. & S. Bearings. This is in accordance with statement I have made both to the ——— and F. & S. people. The makers of the F. & S. Bearings are, therefore, correct in stating that their bearings were used in this car as long as they do not state they were used exclusively. This car happened to have been assembled before we began receiving axles made at our Plattsburgh plant, which axles are fitted with ——— bearings.

Yours truly,
(Signed) J. G. PERRIN,
Ch. Engineer.

JGP D
Copy to ——— Mfg. Co.

De Palma's Mercedes had F. & S. Bearings

The famous Mercedes cars, which set the fashion to the world in more ways than one, largely use F. & S. Bearings. Manager J. A. Carples, of the Daimler Import Company, says their Chief Engineer told him recently in Germany that F. & S. Bearings were a standard stock equipment on Mercedes cars—both racing and touring.

Ralph De Palma, the metropolitan favorite who drove the Mercedes which finished second, when asked the question which bearings his car had in it, said, "I drove this great car just as I received it from Germany, and if it had any other bearings in it than F. & S., they were placed in it in Germany, and I invite you to inspect it yourselves. The seals on the hub caps are still unbroken, and I have this to say regarding a change of construction in any car I drive: I consider the master mind who designed these racing cars knows what is best to use, and in view of my public announcement of this idea, no one has ever approached me with a view of making a change."

An examination of the De Palma Mercedes car revealed the fact that this car was equipped with F. & S. bearings, and absolutely so in the wheels, which bearings were in dispute.

Regarding the Mercedes which finished third in the race, which was driven by that dashing young American driver, Spencer Wishart, we have this to say: Although the majority of the bearings used in the car are now of another make, still some F. & S. bearings were used, but not enough to emphasize their use—all of which leads up to the variation in the practice of compound use of ball bearings in cars, and hence the use of ball bearings is sometimes as Herbert Spencer once said, "A combination of heterogeneous changes, simultaneous and successive, in correspondence with external coexistences and sequences."

The F. & S. bearing De Palma Mercedes finished second in both the Vanderbilt and Grand Prix races, and is ready with-

out repairs for another race to-day, while the Wishart Mercedes did not finish in the Grand Prix, and lies dismantled to-day.

And so in summing up the result of the Mercedes ball bearing claims, one is reminded of the following squib: "Faith," said the policeman, examining the broken window, "this is more sayrious thin Oi thought it was! It's broke on both sides!"

A Disclaimer

The following letter from Mr. A. L. Riker, Vice-President and Chief Engineer of the Locomobile Company of America, in reply to a letter of ours asking for information as to what bearings were used in Robertson's Locomobile in the 1908 Vanderbilt Race, prompts us to cheerfully enter a disclaimer here as to the use of our bearings in that car. The statement, however, having been originally made in the hurry of preparing copy for an ad, the writer having in mind at the time the fact that the Locomobile Company, since that time, have been continuous users of F. & S. Bearings.

THE LOCOMOBILE COMPANY OF AMERICA ENGINEERING DEPARTMENT

J. S. BRETZ COMPANY,
New York City.

BRIDGEPORT, CONN., Dec. 21, 1911.

GENTLEMEN—I have your favor of the 20th instant and note contents of same. I would state that the make and type of the anti-friction bearing used in Robertson's winning Locomobile in the 1908 Vanderbilt Cup Race, were the ——— annular ball bearings. These ball bearings we used in the wheels, jack shaft bearings and transmission. They also were the American made ball bearings, as they were the same as we used in the Vanderbilt Cup Race of 1906.

Yours very truly,
(Signed) A. L. RIKER,
Vice-President.

This closes this discussion in the trade press as to the results of the bearings used in the Vanderbilt Race as far as we are concerned, our time and thoughts being turned towards the coming New Year, the Shows and other events, and in conclusion, we wish that "Content be ever yours—good health, prosperity, and thought for us who ever seek to serve."

BRETZ COMPANY
F & S
Ball Bearings
250 West Fifty-fourth, New York

Please mention The Automobile when writing to Advertisers



The Lesson of the Year

A **N**OTHER year has completed its cycle—the richest in experience with motor trucks that the world has ever known. And now, already the epoch-making “shows” are again claiming the attention of the whole automobile world, trying to visualize the progress which the twelve months have made. This experience and progress must have their lessons for every business which has deliveries to make. Perhaps the most important lesson is the fact that so many hundreds of businesses have found—not that they could use the motor truck—that was always true—but that it means so much to their business in increased service, in increased business, in general effectiveness all along the line. In showing business men this pleasant solution of their delivery problems, no truck has been more prominent or taken a bigger share of the burden than the White.

The Simplest Truck—The White

Great as has been the progress of motor trucking during the last year, numerous as have been the new fields tapped by this new method of transportation, motor trucking possibilities are just beginning to be understood, and with each succeeding day the field grows wider and wider until there seems to be no reasonable limit to the houses that can profitably use motor trucks. In this ever widening field, one truck must always hold its own, always be one of the first to be considered. That one is the White, because of the peculiar simplicity of its engine design—of ease and operating its engine and the making of any adjustments which may ever be necessary. Any engine built to-day would pattern after the White because the designer would want to get all the power possible with the smallest charge of gasoline—in other words, power in its most economical form—which means the long-stroke engine. The long-stroke engine, with its cylinders cast en bloc, is the simplest form of high-power motor, allowing an almost complete elimination of the usual paraphernalia that litter the average engine. The White engine is easy to care for and operate, is attractive to the driver, consequently does not discourage him to neglect his work; and this is half the battle. A truck engine with complicated mechanism that takes hours to unravel does not invite a tired driver to investigate the cause of some minor trouble which may very quickly become a major trouble if neglected. Further, the White Trucks are built in such capacities as to take care of all your business, being made in fifteen-hundred-pound delivery wagons, ton-and-a-half, three- and five-ton trucks, with standardized type of engine in all.

Why not submit your delivery problem to us? Let us suggest the size and type of trucks you need. If interested we have testimonials of many in your line of business, which tell you better than we can what you can do with the White truck.


The White Company

800 EAST 79th STREET, CLEVELAND, OHIO

CHICAGO

Chicago is the first city to officially recognize the need of a more efficient warning signal than the bulb-horn.

The following ordinance was enacted by the Chicago City Council on December 4, 1911:

"Every motor vehicle or motor cycle while being used upon the streets, alleys and public places of this city shall be provided with a suitable bell, horn or other signal device; and it shall be unlawful for any person to use any device which will not produce an abrupt sound, sufficiently loud to serve as an adequate warning of danger; and it shall be unlawful for any person operating any motor vehicle or motor cycle to make or cause to be made an unnecessary noise with any such bell, horn or other signal device, or to use the same except as a warning of danger."

The time is near when similar action will be taken by other cities.

The safety of the streets demands such action.

The bulb-horn is universally recognized as inefficient, unreliable, unsafe. The

trend of public opinion is against its use.

The makers of seventeen motor cars have foreseen this trend and are regularly equipping with the Klaxon—approved by the public and the law, and used by more than 70,000 motorists.



KLAXONET

LOVELL-McCONNELL MFG. CO., Newark, N. J.

KLAXON

The Public Safety Signal



KLAXON

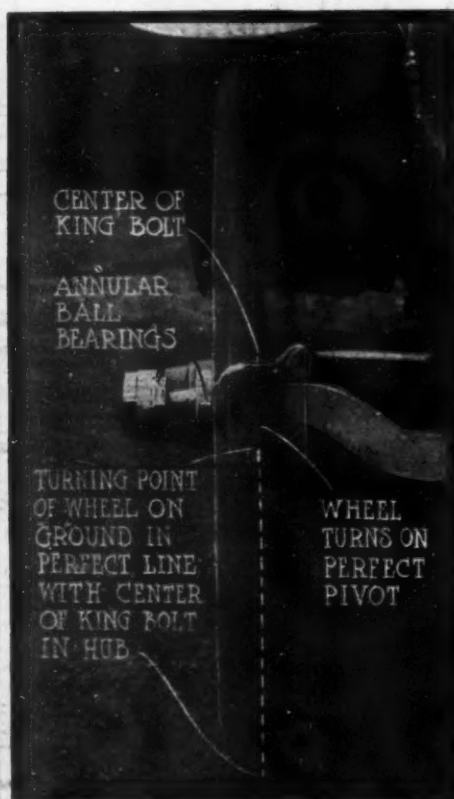
Greatest Safety Device Ever Invented For The Automobile

The B & L Caster Front Axle

SAFE DRIVING

EASY STEERING

PERFECT CONTROL



B & L Caster Front Axle

The advantages of caster steering can easily be seen by contrasting the illustration on the left with the illustration on the right.

Note how the turning point of The B & L Caster Axle is placed absolutely in the center of the wheel hub. This makes a perfect pivot because the turning point of the wheel on the ground is in perfect line with the center of the king bolt in the hub.



King bolt or turning pin located 3-8 of an inch forward of the center of spindle so as to cause a perfect caster or eccentric front wheel.

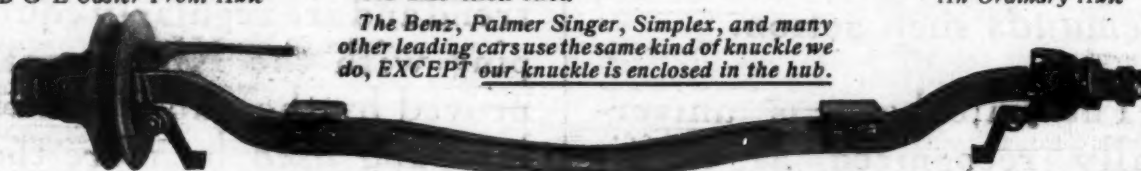
In an ordinary axle the center of the king bolt is $3\frac{1}{2}$ inches outside of the hub and the wheel does not turn on a perfect pivot. The strain on the wheel makes it hard to steer and is often the cause of broken knuckles, which result in serious accidents and loss of life.

A broken knuckle is an impossibility with The B & L Caster Front Axle—strain enough to break it would break the axle itself first.

The Benz, Palmer Singer, Simplex, and many other leading cars use the same kind of knuckle we do, EXCEPT our knuckle is enclosed in the hub.



An Ordinary Axle



When The B & L Caster Front Axle is used the front wheels travel absolutely in the same direction that the back wheels push unless turned purposely by the driver. Steering is so easy as a result of this construction that the steering wheel can be turned with the little finger, and even if the hands are removed altogether the car will continue in a straight course, regardless of road conditions.

Equip your car with The B & L Caster Front Axle and it will possess the following advantages:

Will steer 85% easier—you'll have 90% better control—neither knuckle nor spindle can be broken—car can be turned around in one-quarter less space—front wheels will turn on perfect pivot—control just as easy in sandy or muddy roads as on smooth highway—steering mechanism can become disconnected and car will continue in a straight course, thus allowing plenty of time to stop before an accident occurs—tie rod can be removed, leaving one wheel free, and with control of other wheel car can be guided in any direc-

tion—vibration of steering wheel will be eliminated—wheels will roll into and over holes without sidethrust—75% of skidding will be prevented—weight of car will be located on the knuckle instead of being distributed over an outer point of suspension—friction and strain on tires when turning will be eliminated on account of wheels being set perpendicular—bearings will last twice as long because the caster construction eliminates side thrust—you'll enjoy safety in driving you never experienced before.

Let us send you names of manufacturers who will, when requested, equip cars with this axle, which insures Safe Driving, Easy Steering and Perfect Control.

A. S. Burnell, President and General Manager
QUEEN MANUFACTURING CO., Chicago Branch, 1346 Michigan Ave.

Please mention The Automobile when writing to Advertisers

NEW DEPARTURE BALL BEARINGS.

Double Row
Combined Radial
and Thrust

Single Row
Strictly Radial

Radax
Radial and Axial

STEADILY increasing use of New Departure Ball Bearings proves that this strictly American product is equal to the foreign in all respects. New Departure quality is due to

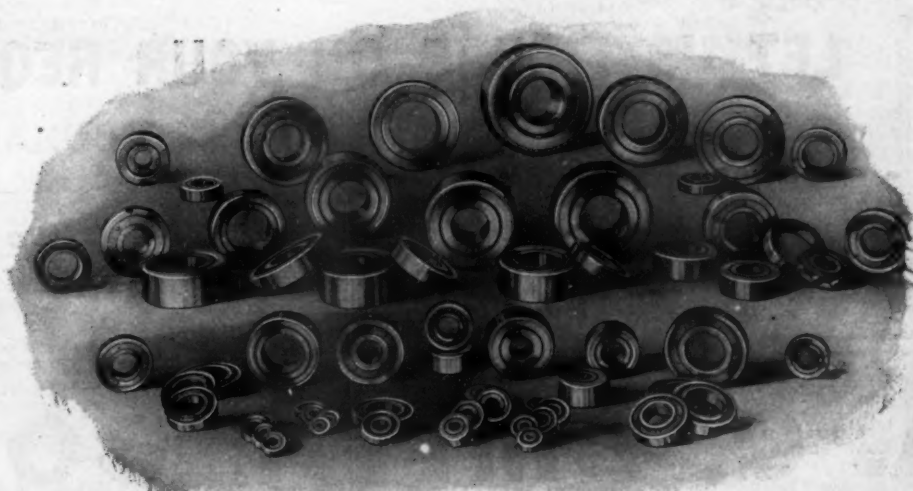
Guaranteed Materials
Guaranteed Workmanship
Guaranteed Finish
Advanced Manufacturing Processes
Supervision of every detail of Production by expert engineers.

Gauging for precision of measurement at every stage of manufacture.

Final inspection which rejects all bearings not true within extremely close limits.

We can give you bearings specially adapted for any place where the use of ball bearings is practical and can satisfy you on *prompt deliveries.*

**The
New Departure
Mfg. Co.**
Bristol, Conn.
Western Branch:
1016-17 Ford Bldg., Detroit



PRESSED STEEL FRAMES

FOR TRUCKS AND PLEASURE CARS



27TH STREET PLANT

**We Make 60% of All the Pressed Steel Frames
Used in this Country**

LET US FIGURE ON YOUR REQUIREMENTS

—EXHIBIT—

**New York, Madison Sq. Garden
JAN. 6-13, 1912**

—EXHIBIT—

**At Chicago, Coliseum
JAN. 27-FEB. 3, 1912**

A. O. SMITH COMPANY

MILWAUKEE

Please mention The Automobile when writing to Advertisers



The One Proven Successful Valveless Motor

Everybody, nowadays, has come to realize the simplicity and super-efficiency of the valveless construction. The whole automobile world is ringing with extravagant claims and arguments for the valveless motors now so widely exploited.

BUT REMEMBER THIS. Every such claim put forth applies with doubled force to the Elmore valveless motor—which, in a dozen years of successful service, has in the hands of owners throughout the country proved both its simplicity and its superiority. We passed the experimental stage years ago.

And the Elmore does not cost \$3,000, \$4,000, \$5,000. There is a model to fit every motoring need, at a price well within the purchasing power of the most conservative.

The Elmore was the Pioneer in Valveless

Engine Construction

We have advocated the valveless engine since the inception of the automobile industry in America. The first valveless two-cycle Elmore engine that was installed in a motor-car was a success—a great success. And each year we have refined and simplified it until, in this year's models, we are installing a motor that we believe to be as perfect as human ingenuity can make it. We ask you to prove for yourself that it is the simplest, most efficient automobile engine extant.

In buying an Elmore you are not buying an experiment or a novelty, but a motor tested by thousands of owners for over a dozen years—a motor which, by virtue of patent rights, no other motor-car can have.

Elmore Construction is of the Best

There could be no better built car than the Elmore. Skilled workmanship and careful supervision accompany every detail. We aim to make the car itself a worthy setting for the gem of a motor that runs it.

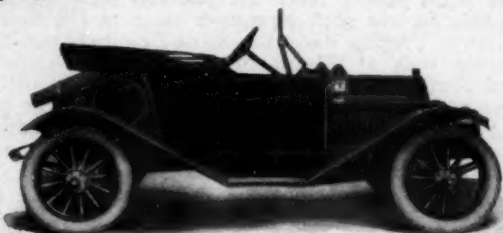
Whether your need be for a roadster or for one of the various types of touring car, you will find an Elmore model which in appearance and in service will rank with any car at any price. And the wonderful, exclusive Elmore motor assures you a smooth, sweet-running car with the utmost in power efficiency, and with an entire absence of valve troubles and valve expense.

Write for the Elmore Book

We have prepared a very interesting booklet about the Elmore car, which will be sent free on request, together with the name of the nearest dealer where you can see and test this wonderful car for yourself.

THE ELMORE MANUFACTURING CO., 212 Amanda Street, Clyde, Ohio

DEALERS: For 1912 we have doubled our factory capacity, thus enabling us to double our output. We are, therefore, enabled to take on a few additional dealers in sections not yet allotted. Write us for 1912 proposition on the one moderate-priced "car with a reason."



Torpedo Roadster, \$1150, Top and Windshield Extra



5-Passenger Fore-door Touring Car, \$1600, Top and Windshield Extra



Head



Side



Rear

GENERAL ELECTRIC COMPANY'S EDISON MAZDA AUTOMOBILE LAMPS



AN Electric Lighting System on the car is evidence of the manufacturer's progressive policy in supplying the demand for a clean, safe, reliable method of lighting.

Electric Lighting needs no attention and any lamp can be operated from the dash.

Edison Mazda Lamps have been carefully designed for automobile service. Note the compact, close-coiled filament of the headlight.

The filaments of Edison Mazda Lamps are made from a drawn wire as strong as piano wire.

Write for Bulletin 4795, which gives some valuable details on automobile lighting. The bulletin tells how simple it is to wire a car for electricity and how existing lamps may be easily converted to electric.

Write for Bulletin today.

General Electric Company

Main Lamp Sales Office, Harrison, N. J.

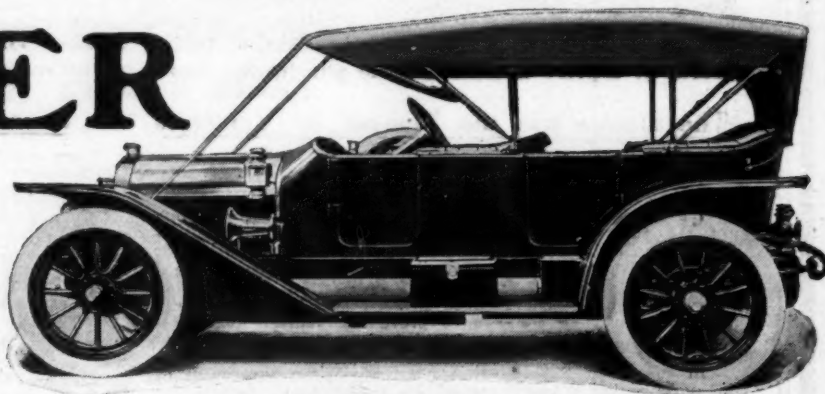
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Principal Office, Schenectady, N. Y.

MERCER

The Champion Light Car

In the production of all Mercer models quality is the first aim.



Type 35—Series A and B—Five-passenger or four-passenger torpedo bodies—fully equipped—\$2,750.

NEW MERCER SERIES

In your visit to the Automobile Shows, don't fail to give all Mercer models your most rigid inspection. Compare our new type 35, series A and B, foredoor torpedoes, and our raceabouts and runabouts, with the product of any other maker. We honestly believe you will find it hard to get as good a car, and impossible to get a better, at the same price as our new series.

You will find embodied in all Mercer models every up-to-the-minute, thoroughly tried-out, and really meritorious improvement. You will find a car that is strongly built, has power and speed in abundance, has

grace of line, is luxurious in appointments and has comfortable riding qualities.

We want you to learn for yourself why the Mercer was able to win such strenuous tests as the Savannah Challenge Trophy Race, the Kane County Stock Championship race at Elgin, Ill., and other notable 1911 speed contests. All-round efficiency made possible the winning of these contests. Every Mercer car turned out possesses efficiency equally as great as our raceabout, which has made a creditable clean-up on both track and road. We can and will prove this.

Send for detailed specifications or see us at the shows

MERCER AUTOMOBILE CO., 400 Whitehead Road, TRENTON, N. J.

Please mention The Automobile when writing to Advertisers

Make Your Car a Convenient Car



Bayonet Socket Cable Coupling for an electric lighting system. This connector gives close positive contact with absolutely no leakage of current—commendable features where low voltage must of necessity be used. All parts of this coupling are well insulated and in addition to its convenience in making connections the terminals are protected from exposure. The bayonet joint prevents coupling jolt-ing loose.



Cable Coupling



Flush Socket and Receptacle Coupling. A neat combination for soldering to the base of the lamp. Lighting circuit is broken by the coupling, allowing the lamp casing to be removed if necessary. The oil reservoir may still be retained in the lamp if desired, in addition to the Flush Socket.



Flush Socket and Receptacle Coupling



Flush Socket



Two-gang Flush Tumbler Switch

Flush Socket and Receptacle Plug. This socket is fitted with a flange similar to the socket above mentioned and can be used in place of it. Instead of a coupling to disconnect or connect circuit, a **Flush Receptacle** and plug is used which can be mounted anywhere on the car. This is an exceptionally useful arrangement for a portable extension light.

All sockets are made to fit our sturdy drawn wire Edison Mazda Lamp.

Switches. Four-gang switches for full electric light equipment, designed to withstand all the conditions of automobile service. Three gang switches just as rigidly constructed, for three or five lamp equipment. Flush or surface type switches built to stand the same hard service, also single pole switches, two-gang switches, etc. No splicing or joints in wiring are necessary with these switches, as all connections are made at back of switch by means of bus bars.

The installation of these "car comforts and conveniences" cannot fail to impress the prospective purchaser in favor of your car.

General Electric Company

Principal Office, Schenectady, N. Y.

3303

TWELFTH NATIONAL
AUTOMOBILE SHOW



MADISON SQUARE GARDEN

PART I
JANUARY 6-13

**PLEASURE VEHICLES—Gasoline and Electric—Motor-
 cycles—Parts—Accessories**

The Following Cars Will Be Exhibited:

Aleo	Columbia	Inter-State	Mitchell	Pope-Hartford	Stoddard-Dayton
American	Corbin	Jackson	Moline	Premier	Thomas
Amplex	Courier	Knox	Moon	Pullman	White
Atlas	Elmore	Locomobile	National	Peerless	Winton
Brush	E-M-F	Lozier	Oakland	Reo	(Electric)
Buick	Everitt	McIntyre	Ohio	Selden	
Cadillac	Flanders	Marmon	Oldsmobile	S. G. V.	
Cartercar	Franklin	Marquette	Overland	Simplex	Detroit
Case	Garford	Matheson	Packard	Speedwell	Baker
Chalmers	Haynes	Maxwell	Palmer-Singer	Stearns	Flanders Colonial
	Hudson	Mercer	Pierce-Arrow	Stevens-Duryea	Waverley

PART II
JANUARY 15-20

**COMMERCIAL VEHICLES—Gasoline and Electric—
 Parts—Accessories**

The Following Cars Will Be Exhibited:

Aleo	Grabowsky	Morgan	Reo	(Electric)
Autocar	Hewitt	Packard	Sampson	Baker
Brush	Knox	Peerless	Saurer	Bronx
Buick	Locomobile	Pierce-Arrow	Speedwell	Detroit
Cartercar	Lozier	Pope-Hartford	Stearns	G. V.
Garford	McIntyre	Rapid	White	Studebaker
	Mack	Reliance		Ward

Management: SHOW COMMITTEE, 7 East 42d Street, New York

The Atwater Kent Ignition System

Primary or Secondary Equipment

OWNERS of cars equipped with both magneto and Atwater Kent systems frequently discard the former and use the latter as sole equipment

Owners who begin with the Atwater Kent System never add another. They can imagine nothing more dependable—and they are right.

No source of current is so reliable as a battery. Add the positive, mechanically-driven make and break of the Atwater Kent contact maker, the large, carefully-built A. K. spark coil and the well-insulated A. K. distributor—and you have a combination of elements impossible to surpass for sheer clock-like regularity of action. Yet its very simplicity enables it to be sold at a moderate price.

Use the Atwater-Kent Spark Generator or UNISPARKER as you like—with dry or storage battery, or with a dynamo lighting system. Use it as primary or secondary equipment; it will never play tricks.

Applicable at small cost to most new or old cars.

Booklet gives full technical description.■

ATWATER KENT MFG. WORKS

42-50 NORTH SIXTH STREET
PHILADELPHIA, PA.



F. C. Millhoff

E. C. Gammet

THE M & M MANUFACTURING CO.
Manufacturers of Vulcanizing Solution

Akron, Ohio, July 18th, 1910
Atwater Kent Manufacturing Works,
Philadelphia, Pa.

Gentlemen:—

I received the new Unisparker and can say it is certainly giving satisfaction: in fact, I would sooner run on the Unisparker than on the magneto. I think that this is the best system yet, will always believe so providing the Unisparker works as well as it does now.

Yours very truly
(signed) F. C. Millhoff.



★ PENNSYLVANIA ★ TEXAS ★ CALIFORNIA ★ ILLINOIS ★ WASHINGTON ★ ★ ★ ★

The Only Complete Car

Mr. Dealer:
Don't You Want to
make these sales?

Buyers will want the Inter-State—the only complete car ever produced! The car that in itself performs all the labor of Electric Self-Starting, Electric Lighting and Ignition; Tire Pumping; and the Automatic regulation of Fuel Consumption.

The
Labor-Saving
Self-Controlled

Inter-State

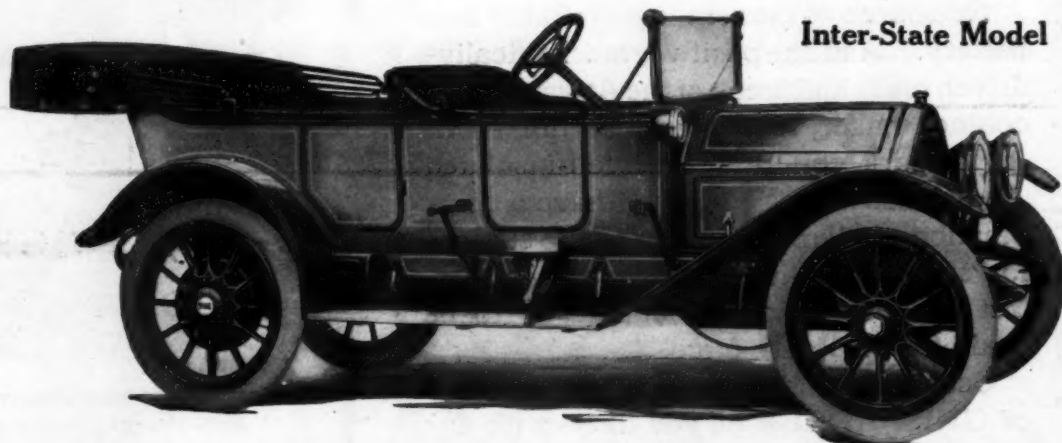
King of all
Cars for
1912

Electric Starter Starts the motor without "40" and "50" Models cranking, without danger, without touching the clutch pedal, without engaging any gears, without releasing a pedal after motor starts. Just push the switch when you are ready to start—nothing more. It's as easy as striking a match.

Electric Lights Consist of two powerful head "40" and "50" Models lamps with the improved dimming feature. Two dash lamps and a tail lamp. Also the small lamps for illumination of speedometer and clock dials. All or any combination of lights can be turned on by simply turning the switch. Always ready—no tanks or generators to look after and renew.

Automatic Carburetor Entirely regulated "40" and "50" Models from the steering post. A simple movement of the lever by your finger gives all the regulation required for economy of fuel and increased power. Perfect results to novice and expert.

Long Stroke Motor 4 cylinder type is a tri- "40" and "50" Models umph of engine making. Made and tested out entirely in the great Inter-State factory. By an ingenious construction all back pressure is avoided and the power "hangs on" at low speed like an electric motor. Enclosed valves make it almost noiseless.



Inter-State Model "40"

Model 40—5 Passenger, Fore Door Touring Car.
Model 41—4 Passenger Demi Tonneau.
Model 42—Roadster type—all with the splendid new en bloc motor, 4½" bore, 5½" stroke, developing 5 to 8 H. P. more than rated, 3 speeds forward and one reverse, completely equipped and with all 1912 features here mentioned.

\$2400

Model 50—7 Passenger, Fore Door Touring Car.
Model 51—4 Passenger, Demi Tonneau.
Model 52—Roadster type—all with the new "T" head 5" bore, 6" stroke motor, developing 8 H. P. more than rated by actual test, 4 speeds forward and one reverse, completely equipped and with all 1912 features here mentioned.

\$3400

The Inter-State "40" and "50" Equipment is Complete High grade top, slip cover, automatic windshield with patented ventilating attachment, a wonderful pair of search head lights; electric side lights; combination tail light; heavy nickel and enamel finish throughout, dimming device on headlights for use on city streets at night; speedometer, clock and electric light combined; signal horn; air adjustment of fuel mixture on steering column; commodious leather flap pockets on inside of doors; cocoa mat; extra demountable rim, gasoline gauge on dash; power tire pump and complete tool outfit.

Write, wire or phone (our expense) for agency
Inter-State Automobile Company,

See the INTER-STATE line January 6-13, 1912, at Madison Square Garden Show—Space 50, Exhibition Hall



★ NEW YORK ★ MARYLAND ★ OHIO ★ MICHIGAN ★ FLORIDA ★ MAINE ★ ★ ★ ★

Please mention The Automobile when writing to Advertisers

MASSACHUSETTS • IOWA • WISCONSIN • VIRGINIA • MISSOURI •

Distinctive Inter-State Features

You Cannot Find All These Features in Any Other Make of Car

All "40" and "50" Models have every feature here mentioned.

Long Stroke Motors— $4\frac{1}{2}$ inches x $5\frac{1}{2}$ inches in "40's." 5 inches x 6 inches in "50" Models. Noiseless—No back pressure.

Large Wheels and Tires—36 inches x 4 inches in "40's." 36 inches x $4\frac{1}{2}$ inches in "50" Models.

Demountable Rims—(Set of Five.)

Power Tire Inflator—Instantly available and worked from motor power. Tire pumping labor eliminated.

Multiple Disc Clutch—Steel and Bronze, 10 inch Discs, with Cork Insert Contact.

Imported Annular Ball Bearings—Used wherever required.

Long Wheel Base—118 inches in all "40's." 124 inches in all "50" Models.

Complete Electric Light System.

Automatic Regulation of Fuel Consumption—Effectuated by a wonderful New Carburetor, economizing and gaining added power to the motor.

Housed Valves and Valve Springs—Insuring Quiet Operation and Cleanliness.

Dropped Frame Construction—Narrowed for short turning, the Drop allowing the low, straight line effect and giving great stability to car.

Gasoline Gauge on Dash—Showing at a glance the supply and rate of consumption of fuel.

Inter-State

Catalogue

Dealers and buyers ought to have this book. The entire Inter-State line is beautifully illustrated, and specifications and features are minutely described. It gives the best idea possible of the Inter-State, with the exception of examining the car itself.

Send your name for a free copy and be sure to see these wonderful models of 1912 Inter-State cars.

See the INTER-STATE line January 26th-February 3rd, 1912, at Chicago—Space A-4 First Regiment Armory

Dept. A, Muncie, Indiana, U. S. A.

BOSTON BRANCH: 153 Massachusetts Ave.

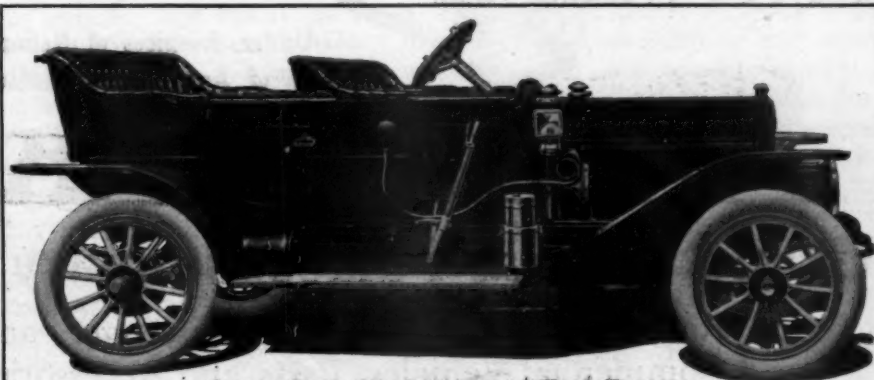
OMAHA BRANCH: 310 S. Eighteenth St.

COLORADO • INDIANA • ALABAMA • KANSAS • MINNESOTA •

Mr. Buyer: The Inter-State "40's" and "50's" are the long looked for perfect cars. The first models have created a sensation. If you have owned a car you will realize what a wonderful innovation the Inter-State is. If you are buying your first car, you will want no other than the perfect, self-acting Inter-State, which has robbed motoring of all disagreeable features.

Inter-State

These powerful, luxurious "40" and "50" Inter-State cars can be enjoyed by the whole family and can be handled by a woman with the same ease and safety, with which she controls an electric coupe. The Inter-State is designed, built and equipped for absolute pleasure and service. Nothing has been left out. You will have to make no further outlay for accessories. Future years may produce its equal, but for 1912 the Inter-State is KING. The Inter-State is the car of supreme quality and beauty, built from the ground up in the great Inter-State factory.



Inter-State Model "30-A" Fore Door

We offer two lower priced cars of Inter-State quality:

Model 30-A—Fore Door, 5 Passenger Touring Car, \$1750

Model 32-A—Roadster - - - - - \$1700

These cars are equipped with 40 H.P. 4-cylinder L-Head long stroke motor; High tension imported magneto, storage battery and timer; multiple disc cork insert completely housed clutch; Sliding gear selective type transmission, three speeds forward and one reverse. All construction being of highest grade of workmanship and of latest improved design. Equipment consists of two gas headlights with generator, side and tail oil lamps, nicked bulb horn and tools; combination tool and battery box; robe and foot rail. Nickel plated metal trimmings throughout.

In addition to the equipment mentioned and at a small additional cost, these two models will be fitted with Top, Automatic Windshield, Speedometer and the Presto Self-Starter.

Dealers: The Inter-State line covers the needs of the buyer who wants a moderate or a high priced car. Write, wire or phone (our expense) for agency.

Inter-State

THE National Automobile Shows of 1912



Under Auspices of National Association
of Automobile Manufacturers, Inc.

NEW YORK

Grand Central Palace—January 10-17

A Complete Display of Passenger and
Commercial Vehicles, Parts and Accessories

CHICAGO

Coliseum and 1st Regiment Armory

January 27 to February 3

February 5 to 10

Passenger Vehicles, Parts
and Accessories.

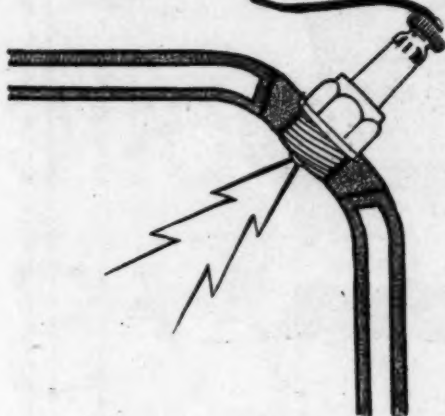
Commercial Vehicles, Motor-
cycles, Parts and Accessories.

The Entire Trade in One
Comprehensive Exhibition

S. A. MILES, Manager

7 East 42nd Street, New York

A Hot, Fat Spark to the Centre



Using a separate contact breaker for both battery and magneto—equipped with the very latest Eisemann pole pieces—carrying our most advanced type of breaker boxes—perfectly accessible in all its parts—using nothing but the finest India amber mica as the insulating medium in the condenser; the “type E. M.” Eisemann high tension dual ignition system is unquestionably the greatest dollar for dollar ignition system on the market. It possesses all of

the exclusive points of Eisemann excellence both as to material used and manufacturing methods employed, and yet is sold at comparatively a low price.

This type E.M. dual ignition magneto consists of the E.M. direct high-tension magneto and a spark coil and switch. The coil is used only in connection with the battery. In this system great care has been taken to use only such parts in common for both battery and magneto as are not subject to accident or wear.

The vulnerable parts, such as the circuit boxes, as mentioned above, are applied individually for each circuit. Particular attention is called to the breaker box details as illustrated in the accompanying cut. Instead of using long steel pieces riveted onto the sides of the breaker box as the contact cams for making and breaking the circuit, it will be noticed that the Eisemann cams are large, round, steel pins. The use of this shape cam, rather than the other types, provides absolute accuracy in the correct making and breaking of the circuit exactly on 180 degrees revolution. This is true because the cam is in contact with the circuit breaking lever the smallest possible length of time and at the very smallest possible point.



Inasmuch as the fibre piece on the breaker lever is in contact with this cam for the shortest possible time and in the smallest possible measure, there is much less wear and tear on both parts than if the circuit breaking lever were rolling over the long cam for a considerable space of time. The entire breaker box is very strong and sturdy and as near fool-proof as is possible to be constructed.

In order to provide lubrication for the fibre piece on the contact lever, a small oil wick is placed in a slot in the bottom of the circuit breaker, one end of which is in contact with the oil, which seeps out of the ball bearings. Once every revolution of the armature the contact lever laps over this small

wick, thereby being both lubricated and cleaned.

The E.M. magneto may be entirely overlooked by the most in-expert person in not over a minute as every part is accessible.

Both breakers may be inspected while the magneto is in operation.



THE EISEMANN MAGNETO CO.

225-227 WEST 57th ST., NEW YORK

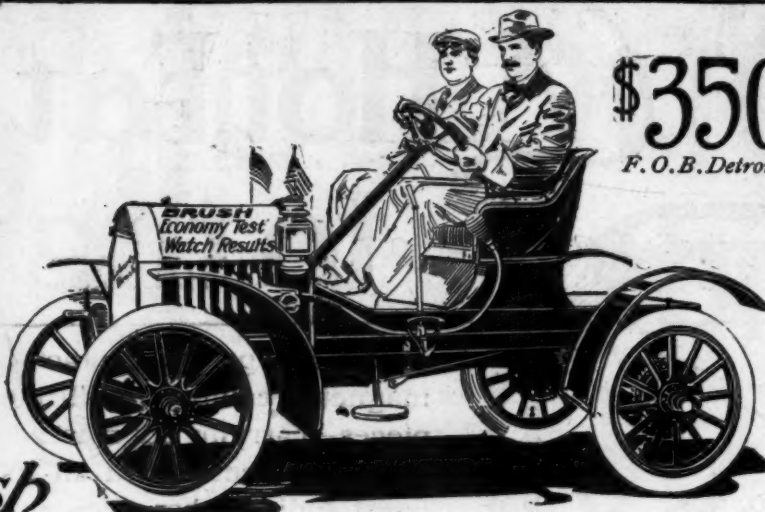
527-528 FORD BUILDING, DETROIT, MICH.

**100 miles
for 39¢**

in this

Liberty-Brush

**This is cheaper transportation
than horse, trolley or train**



ONE Brush car covered 100 miles at a cost of 39 cents in an economy contest.

108 other cars competed and the average cost was only 65 ⁹/₁₀ cents for the distance.

These cars ran in 109 different cities—so they covered all sorts of roads under all sorts of conditions.

98 cars ran the distance for less than one dollar—less than one cent a mile.

One car ran 48.4 miles on a gallon of gasoline. Two others did more than 40 miles—a dozen made over 30 miles.

One ran 100 miles on a gill of oil—or 3200 on a gallon.

Come, see the car—ride in it—learn what it can do. You'll wonder how such an automobile can be built for \$350. It couldn't be, except through the United States Motor Company facilities and economies.

The poorest record was phenomenally good—100 miles for \$1.30. No other known means of transportation is so economical—it is cheaper than a horse, trolley or train.

It is swifter than a horse, more reliable than a trolley, more flexible than a train—you're not compelled to go only where steel rails lead.

Thousands are using the Liberty-Brush effectively in their business, not only for its economy of time and money, but because it makes more work possible, enables one to earn more money.

Write for data how others are using the Brush for pleasure and business.

BRUSH RUNABOUT COMPANY 2 West 61st Street at Broadway New York

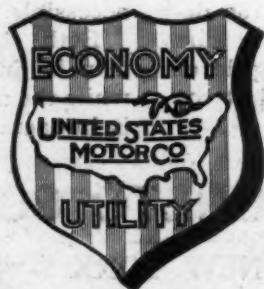
Division of **UNITED STATES MOTOR COMPANY**

Free Monthly Inspection of all our Cars for Twelve Months

Maxwell WINS

hardest Glidden Tour on record. Only team with perfect score. Send for books.

Maxwell-Briscoe Motor Co. 61st St. New York
Div. of **UNITED STATES MOTOR COMPANY**



*The Sign of
Good Cars*

Stoddard-Dayton Saybrook

Complete in every detail of construction and equipment.

Catalog and full particulars on request.

Dayton Motor Car Co. 61st Street and B'way New York
Div. of **UNITED STATES MOTOR COMPANY**

Sampson
Freight and Delivery Motors

Strong as its name suggests.

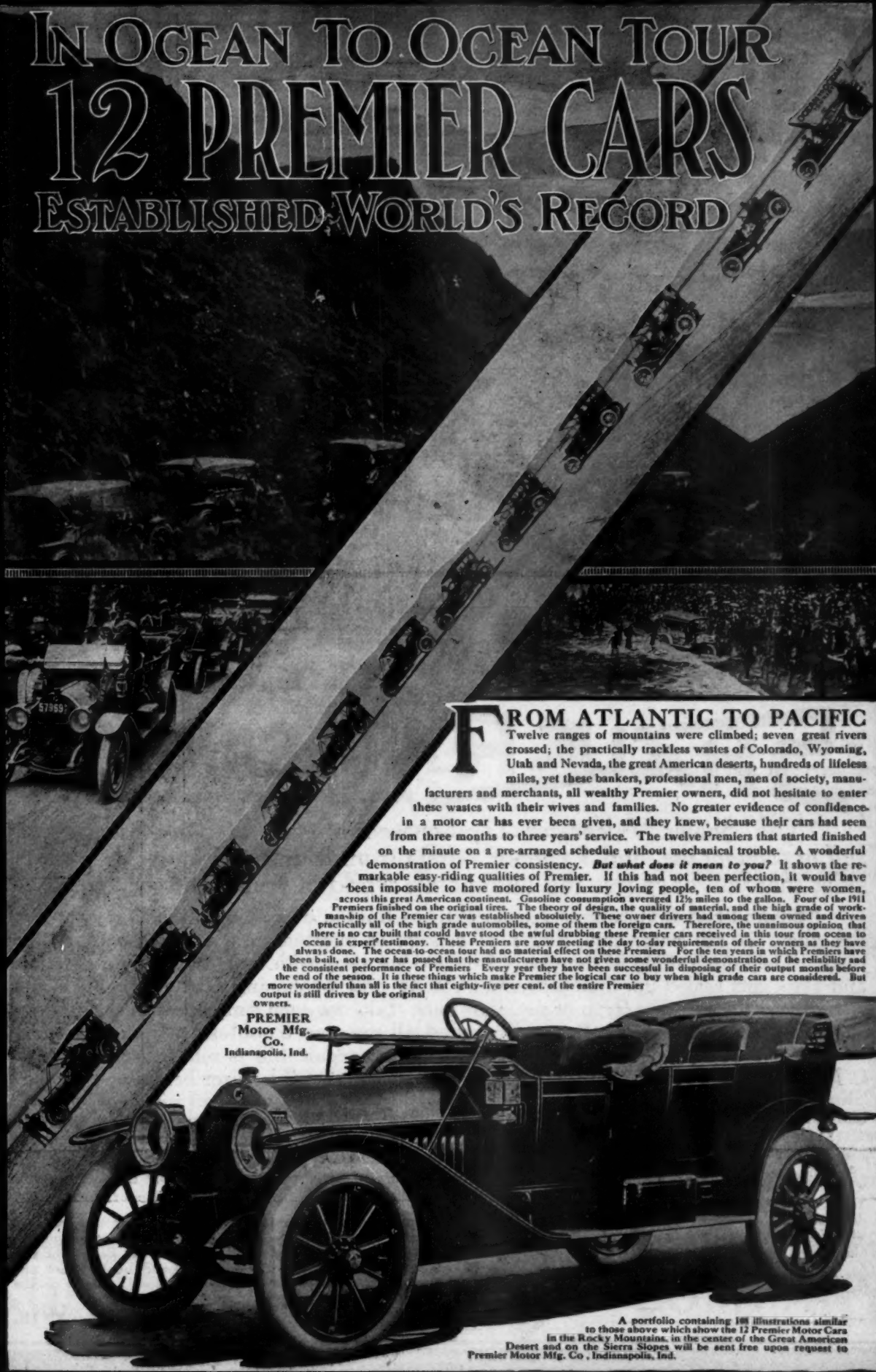
Alden Sampson Manfg. Co. 61st St. New York
Div. of **UNITED STATES MOTOR COMPANY**

Columbia
with Silent Knight Motor

Catalog and full particulars on request.

The Columbia Motor Car Co. 61st St. New York
Div. of **UNITED STATES MOTOR COMPANY**

IN OCEAN TO OCEAN TOUR 12 PREMIER CARS ESTABLISHED WORLD'S RECORD



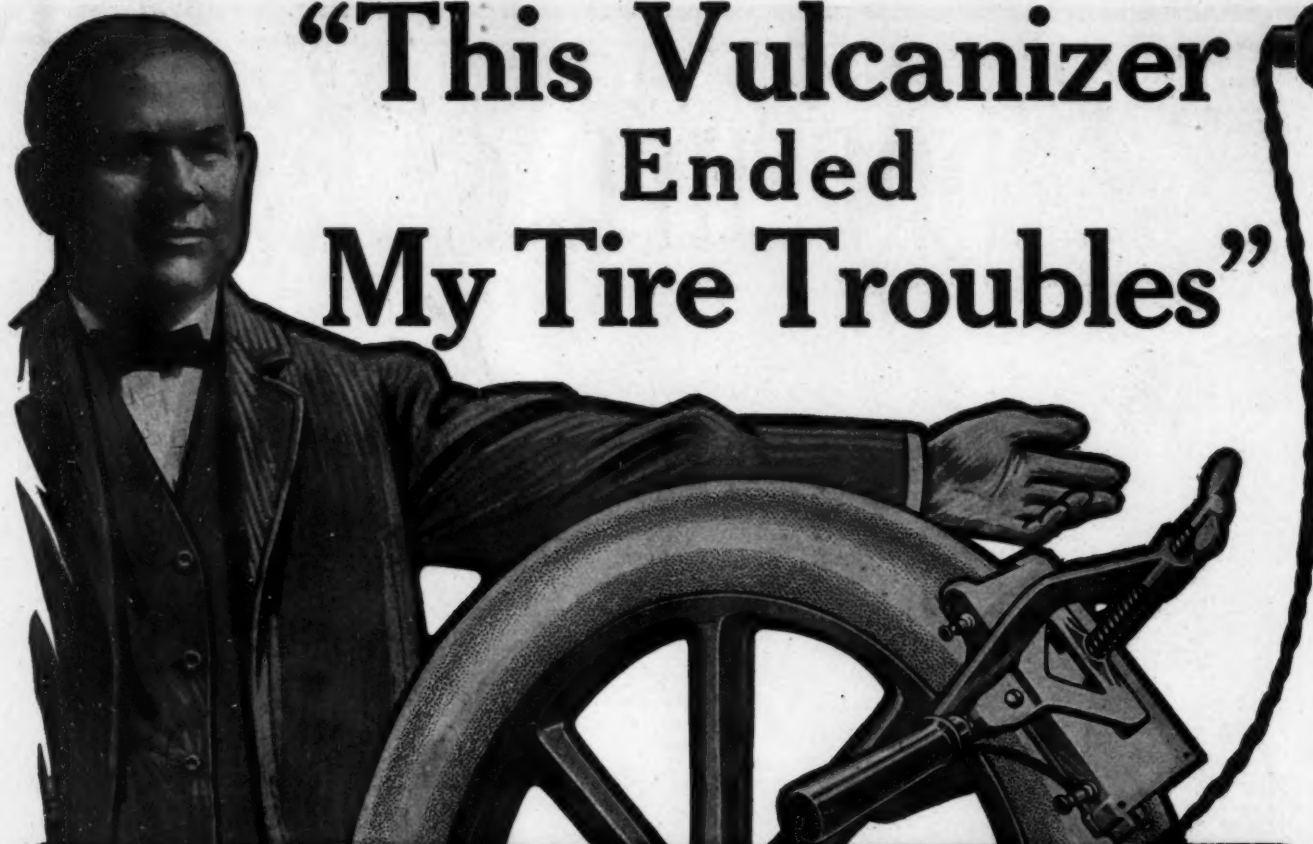
FROM ATLANTIC TO PACIFIC

Twelve ranges of mountains were climbed; seven great rivers crossed; the practically trackless wastes of Colorado, Wyoming, Utah and Nevada, the great American deserts, hundreds of lifeless miles, yet these bankers, professional men, men of society, manufacturers and merchants, all wealthy Premier owners, did not hesitate to enter these wastes with their wives and families. No greater evidence of confidence in a motor car has ever been given, and they knew, because their cars had seen from three months to three years' service. The twelve Premiers that started finished on the minute on a pre-arranged schedule without mechanical trouble. A wonderful demonstration of Premier consistency. *But what does it mean to you?* It shows the remarkable easy-riding qualities of Premier. If this had not been perfection, it would have been impossible to have motored forty luxury loving people, ten of whom were women, across this great American continent. Gasoline consumption averaged 12½ miles to the gallon. Four of the 1911 Premiers finished on the original tires. The theory of design, the quality of material, and the high grade of workmanship of the Premier car was established absolutely. These owner drivers had among them owned and driven practically all of the high grade automobiles, some of them the foreign cars. Therefore, the unanimous opinion that there is no car built that could have stood the awful drubbing these Premier cars received in this tour from ocean to ocean is expert testimony. These Premiers are now meeting the day-to-day requirements of their owners as they have always done. The ocean-to-ocean tour had no material effect on these Premiers. For the ten years in which Premiers have been built, not a year has passed that the manufacturers have not given some wonderful demonstration of the reliability and the consistent performance of Premiers. Every year they have been successful in disposing of their output months before the end of the season. It is these things which make Premier the logical car to buy when high grade cars are considered. But more wonderful than all is the fact that eighty-five per cent. of the entire Premier output is still driven by the original owners.

**PREMIER
Motor Mfg.
Co.
Indianapolis, Ind.**

A portfolio containing 181 illustrations similar to those above which show the 12 Premier Motor Cars in the Rocky Mountains, in the center of the Great American Desert and on the Sierra slopes will be sent free upon request to Premier Motor Mfg. Co., Indianapolis, Ind.

Please mention The Automobile when writing to Advertisers



Read What O. H. L. Wernicke, "Father of Sectional Bookcases" Says About His

SHALER VULCANIZER

"The Shaler Vulcanizer I purchased of you over two years ago is still in constant use, and I cannot refrain from letting you know that I consider that you have put the automobile world in your debt very greatly."

"Before I had a vulcanizer I expected tire trouble every time I took my car out. But there is no longer any danger of accident or inconvenience from blow-outs on the road. They are a thing of the past. I have done away with them by keeping all stone and glass cuts sealed up, thus preventing rotting and weakening of the fabric, which I find was the cause of 99% of my blow-outs. I do not even carry an extra casing now.

This Shaler Vulcanizer has really ended all my tire troubles. My tires last three times as long as they used to, and my tire repair bill is nil. It seems funny

C. A. Shaler Company, 151 4th St., Waupun, Wis. when I realize how skeptical I was about the vulcanizer before you allowed me to try it out. Several of my friends had burned their tires with other portable vulcanizers, and I had little faith. I have since learned that these vulcanizers did not have the Shaler automatic temperature control and overheated the tire unless constantly watched. In conclusion permit me to say that I never purchased an accessory for my car that was as great a trouble eradicator and time saver as my Shaler. No automobile owner should be without one."

Send free copy of "Care and Repair of Tires" and details of ten day trial plan.

My Lighting Current is Direct ☐
Alternating ☐ No Current ☐

Name.....

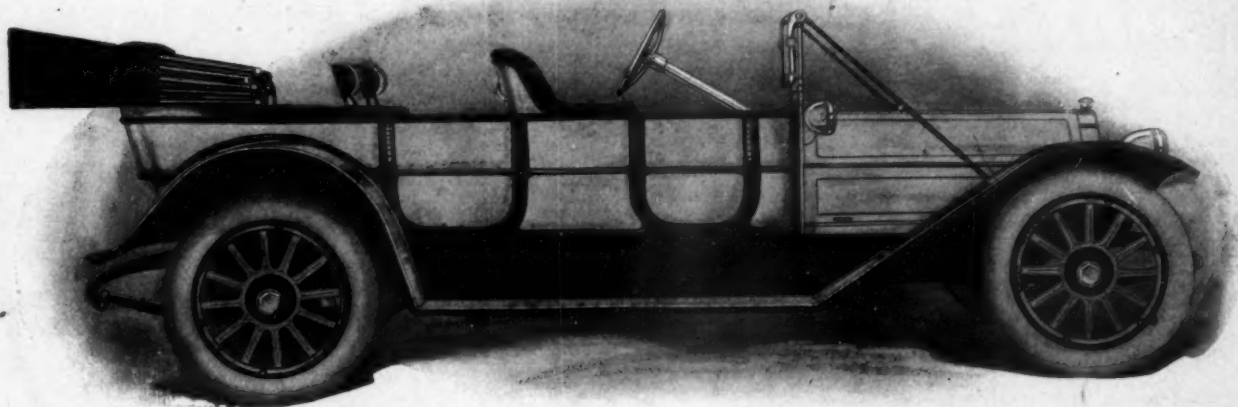
Address.....

If you have ever been up against tire troubles, or feel that your tires are not lasting as long as they should, you owe it to yourself to try this vulcanizer just as Mr. Wernicke did. Write us at once and we will send you the details of this 10 day free trial plan and a free copy of the famous hand book "Care and Repair of Tires," which contains a remedy for every tire emergency. Use the coupon.

C. A. SHALER CO. 151 4th St. Waupun, Wis.

"77" AUSTIN "77"

Some of the Distinctive Features



MOTOR SELF STARTER

Six cylinders. $4\frac{1}{2}$ -inch bore, 7-inch stroke.

High pressure air system, having a special air pump maintaining 150 lbs. pressure in a large tank from which there is also a connection for instantly filling tires with pure air.

IGNITION

Two sets of spark plugs, new double combination system, firing each set separate or both sets simultaneously.

LEFT HAND STEER

With right hand center control, giving a much quicker view of the road ahead when passing any vehicle, and allowing the use of both front doors.

TRANSMISSION

Selective type. Four forward speeds. The center control lever is very short and has a ball and socket joint at the floor connection eliminating all holes or slots in the floor. The segment and also the clutch interlocking device are absolutely positive and are entirely enclosed in the transmission case.

REAR SPRINGS CUSHION SPRINGS

Three-quarter elliptic, 60 inches long.

Entirely new double construction. Exceedingly soft and flexible, and still very strong and durable.

BOTH BRAKES ARE CONTROLLED BY FOOT PEDALS

A slight movement of the clutch pedal entirely releases the clutch and at the same time takes up the slack of the emergency brake which is fully engaged by a further movement of the clutch pedal. The service brakes are also operated by a foot pedal. This arrangement eliminates the hand brake lever and enables the operator to handle both clutch and brake with one foot when desired, leaving the other foot free to operate either the exhaust horn or accelerator. Also, both brakes can be applied instantly without taking either hand from the wheel.

ELECTRIC LIGHTING

"Leece-Neville" Generator, furnishing 20 amperes at moderate speed. 32 c.p. Head Lights, 16 c.p. Side Lights and 4 c.p. Tail Light. A combination switch controlling all lights as desired, including a dimmer for the head lights. Edison Storage Battery.

PRICE \$6000.00

Write for descriptive circular showing many more New, Improved and Special Features.

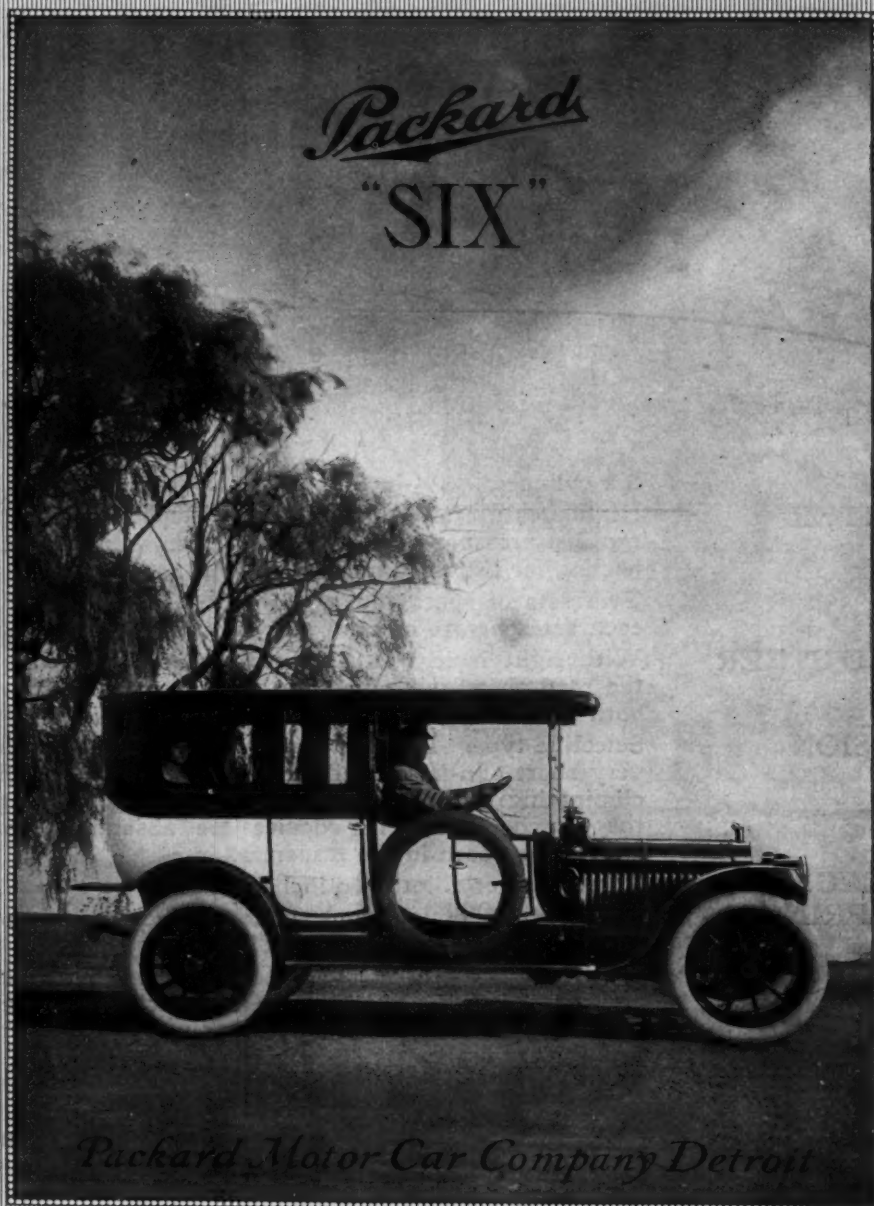
MODEL "45"
6 Cylinders, 4 3-8 x 5 1-4
\$3600.00

*Write for our special
Agency Proposition*

MODEL "50"
6 Cylinders, 4 1-2 x 6
\$4400.00

AUSTIN AUTOMOBILE COMPANY
GRAND RAPIDS, MICHIGAN

Ask the man who owns one



The Limousine

In an EMERGENCY, Which Brake Lining Would You Rather Have On Your Car?

This is a photograph of **Five Leading Automobile Brake Band Linings** after they
had been subjected to a severe durability test under exactly the same
conditions at the Worcester Polytechnic Institute

You Get 100 per cent. Efficiency When You Specify

Length of Service
In Hours of Continuous Use

MULTIBESTOS

Relative
Superiority in Durability

26 HOURS

100%

20.75 HOURS

80%

19.33 HOURS

74.5%

17 HOURS

65.5%

10.25 HOURS

39.5%

At the end of the thorough report upon these tests occurs this convincing statement:

"Finally MULTIBESTOS STANDS SUPERIOR to the brake linings tested with particular
reference to the following points;

"Braking ability under all conditions of service:

"Durability:

"Resistance to effects from heat."

Respectfully submitted

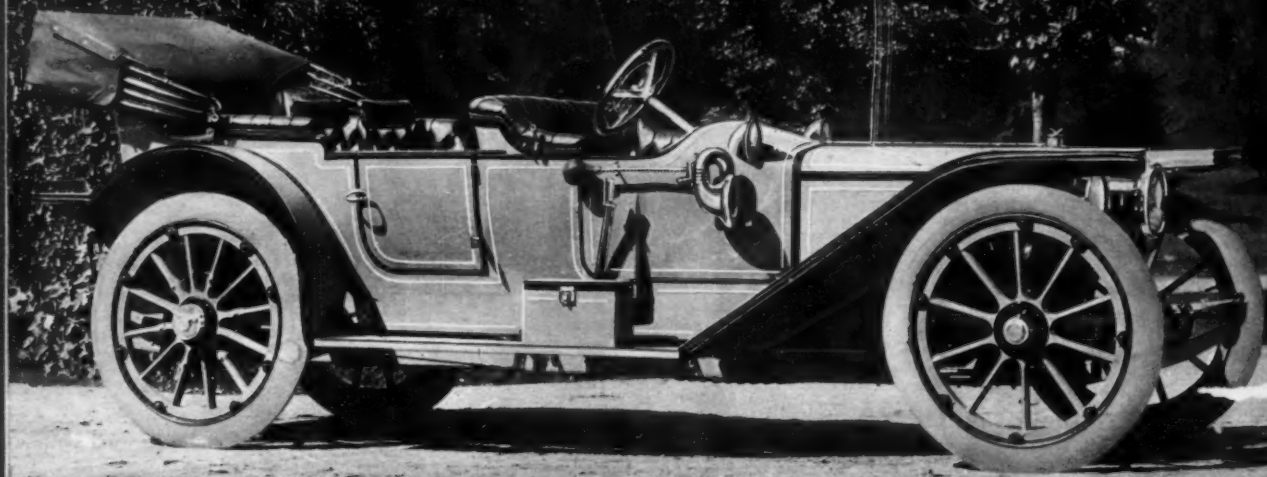
David L. Gallup M.E.

**Standard Woven
Fabric Company**



Write for prices and circulars
WORCESTER, MASS.

The 1912 **AMERICAN** Underslung



The "American Traveler Special" (Type 56), (shown above) \$4500

Six passengers. Wheelbase 140 in.; tires 41 x 4½ in. front and rear on demountable rims. Springs front, 40 inches, rear, 54 inches. Two auxiliary seats in the tonneau. Regular equipment includes top and top boot; 5 lamps, side and tail lights electric, supplied by battery separate from ignition battery; Prest-O-Lite tank; Bosch magneto and storage battery; two extra rims; shock absorbers; foot rest; tire holders; horn; jack, tools and tire repair outfit.

The "American Traveler" (Type 54), \$4250

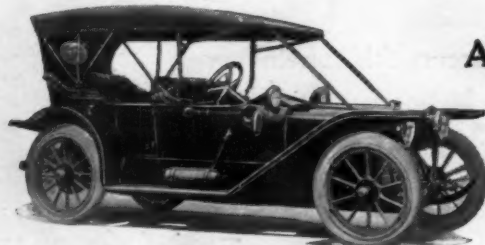
Four passengers; Same chassis as Type 56. Wheelbase, 124 inches. Tire 40 x 4 inches, front; 41 x 4½ inches, rear, on demountable rims. Regular equipment includes top and top boot; 5 lamps, side and tail lights electric, supplied by battery separate from ignition battery; Prest-O-Lite tank; Bosch magneto and storage battery; two extra rims; shock absorbers; foot rest; tire holders; horn; sack; tools and tire repair outfit.

"A Car for Discriminating Buyers"

WE began building Underslung automobiles seven years ago—firm in the conviction that the public would readily see, and appreciate, its many advantages. We have not been disappointed in the result, nor has the public. ¶ To-day there are no less than fourteen manufacturers who have adopted the Underslung idea, although the "American" is still the one Underslung car that is designed as such from beginning to end. ¶ It is seldom that foreign critics comment on anything of merit which has originated on this side, therefore, the following item from an English trade paper, and written by a prominent automobile engineer, is most significant. ¶ "It is interesting to watch motor car development in America, where many of the best makes and so ready a market that they are never heard of here. Thus an Indianapolis firm, The American Motors Company, is building cars of the Underslung design, which I tried two years ago in Paris and commented on very favorably. The illustration shows how beautifully low the car can be built without reducing the clearance. The frame is simply inverted and hangs from the axles instead of being superimposed. The side members are, therefore, in line with the bottom of the undershield, and if a wheel should, for any

reason, break or be thrown, the car would slide harmlessly along like a sledge on its runners.

¶ "Another advantage is that the rebound of the springs on the road acts upward instead of downward, so that the effect of a bad bump is merely to cause a slight sinking instead of a violent jerk. Of course, this arrangement makes a car more stable; in fact, it is almost impossible to overturn it. Larger wheels can be used, thus giving easier running and less tire wear. I have long since proved that low seats are a great advantage, and a low built four-seated body on this chassis looks very well and will provide ideal comfort. I hope one of our leading makers will take up this idea, as it does not involve much alteration of existing designs." ¶ There are a great many advantages of Underslung construction not commented upon in the above article. It is a fact, well understood, and acknowledged in automobile engineering circles, that underslung construction is absolutely ideal. We have just issued a book, which covers the matter thoroughly, and at the same time goes carefully into the designing and construction of all "American" Models, showing good pictures of Underslung cars made by us; complete specifications, prices, etc. ¶ We would be glad, indeed, to mail a copy of it to any one who is contemplating the purchase of any kind of an automobile.



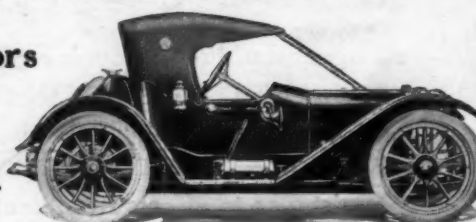
The "American Tourist" (Type 34), \$2250

Four passengers; wheelbase 118 inches; tires 37 x 4 front and rear on Q. D. demountable rims. Regular equipment includes top and top boot; 5 lamps, dash lights electric; Prest-O-Lite tank; Bosch magneto and storage battery; one extra rim; shock absorbers; foot rest; tire holders; horn; jack; tools and tire repair outfit.

American Motors Company

Dept. D

Indianapolis, Ind.
U. S. A.



The "American Scout" (Type 22), \$1250

Strictly a two-passenger car. Wheelbase 102 inches; tires 36 x 3½ inches front and rear on Q. D. demountable rims. Regular equipment includes top and top boot; 5 lamps; Prest-O-Lite tank; Bosch high tension magneto; tire holders; horn; jack; tools and tire repair outfit.

We offer to bona fide dealers the fairest sales agreement ever written

